ARCHIVES OF OPHTHALMOLOGY.

REPORT OF THE PATHOLOGICAL EXAMINATION OF A CASE OF ACUTE PRIMARY GLAUCOMA.

By Dr. ARNOLD KNAPP.

(*With one drawing on Text-Plate I.*)

VERY few eyes with acute primary glaucoma have been histologically examined. A simple statement of the anatomic findings in this case seems worthy of record

F. K., German, 68 years of age, was first seen on Dec. 17, 1901, on account of failure of vision in the right eye of six weeks' duration. The eye was inflamed, vision had been lost for one week, and he had suffered great pain. There was intense ciliary congestion, the cornea was hazy, and the anterior chamber practically obliterated. Pupil, horizontally oval and dilated. Pupillary margin of iris atrophic. T +. Fundus hazy. Lens partly opaque. Optic disc indistinctly visible; no cup. No light-perception. Left eye normal.

The eye was enucleated and hardened in formalin. On opening the eye the vitreous appeared normal, the optic disc showed a slight cup temporally. Retinal veins dilated. The ciliary processes were apparently normal. The lens was displaced forward; the circumlental space was irregular. The eyeball was then prepared for microscopic examination in the usual manner: alcohol, celloidin, hematoxylin-eosin.

The microscopic half section of the eye (see illustration) presents the following noteworthy features: The iris is totally adherent to the cornea and there is no anterior chamber.

Marked ectropion uveæ. The ciliary processes are free from inflammation and contracted. The lens is pushed forward. The posterior chamber is filled with a semi-opaque gelatinous fluid, which has taken on an eosin stain. This is sharply separated by fibres of the hyaloid membrane and zonule from a coagulated mass in the anterior part of the vitreous body.

Under the high power cystic changes are found in the corneal epithelium. The canal of Schlemm is patent and there are no inflammatory changes about the iris angle. The fluid in the posterior chamber shows a delicate granular meshwork stained with eosin. The ciliary processes were carefully examined in depigmented sections (Alfieri's method), but no lesions could be found in the blood-vessels. The coagulated mass in the anterior part of the vitreous is stained with eosin; it consists of the same fine granular material as was found in the posterior chamber; about the periphery and next to the retina a deeper-stained fibrillary arrangement is noticeable and a few free epithelial cells are scattered about. The optic nerve was cut transversely to study the vascular changes but the vessels showed no trace of endarteritis. There are no other important changes.

The examination of this eye has shown in the posterior chamber and in the anterior part of the vitreous body the presence of a substance which seems to me cannot be an artefact but represents an exudate. This exudate contains no cellular elements and shows a delicate granular structure which has taken on an eosin-stain. Its source must have been the ciliary blood-vessels; these however show no changes. This exudate was of such a character as to distend the posterior chamber and obliterate the anterior chamber, thus mechanically producing the increased tension.

A change in the constitution of the intra-ocular fluids plays a part in many forms of glaucoma (serous iridocyclitis, Priestley Smith, Norris and Oliver's System) (after contusion of the eyeball, traumatic cataract, operation on the lens or its capsule, Peters, *K.M.f.A.*, vol. xlii.,

ILLUSTRATING DR. ARNOLD KNAPP'S ARTICLE ON "THE PATHOLOGY OF ACUTE PRIMARY GLAUCOMA"

p. 548). In these conditions the aqueous humor becomes altered from an albuminous effusion, an alteration of the secretion of the ciliary body. This changed fluid is supposed to be eliminated with difficulty or to directly obstruct the channels of exit. It is quite probable that osmotic disturbances are factors under these circumstances as Brown Pusey (these ARCHIVES, vol. xxxiii., p. 128) has suggested.

In the above described case of primary glaucoma an exudate, presumably an albuminous effusion, was found in the posterior chamber and vitreous. If the aqueous humor contains an abnormal proportion of albumen in glaucoma, as Troncoso has shown, sudden elimination or sudden increase of this constituent of the aqueous humor might be regarded as the cause for some acute primary glaucomas, as this examination seems to prove for this case.

The subsequent clinical history of this patient is not without interest. Two years later he returned with an acute attack of glaucoma in the remaining eye. The attack had existed for only two days; the conditions were similar but much less marked than on the first eye. An iridectomy preceded by a posterior sclerotomy checked the glaucoma and there was no return up to the date of the patient's death from apoplexy one year later.

GLAUCOMATOUS EXCAVATION OF THE LAMINA CRIBROSA WITHOUT EXCAVATION OF THE PAPILLA AND WITH MARKED PAPILLITIS, IN A CASE OF ACUTE INFLAMMATORY GLAUCOMA.[1]

By Dr. BROWN PUSEY, Chicago.

(*With one illustration on Text-Plate II.*)

At the International Congress of Ophthalmology held in Utrecht in 1899, Axenfeld showed sections of an eyeball which presented the unique and very interesting condition of glaucomatous excavation of the lamina cribrosa without excavation of the papilla and with marked papillitis. Clinically the case was one of acute inflammatory glaucoma. Later Kruckenberg[2] reported this case in detail and discussed three possibilities as regards the cause of the anatomical findings. Roscher[3] in 1901 reported a case showing findings very similar to those of the above case. He also discussed the question of ætiology. Recently I have studied a case in which the findings in the nerve head are exactly similar to those

[1] Read at the meeting of the American Ophthalmological Society, Washington, May, 1907.

[2] Kruckenberg, F., "Glaucomatöse Excavation der Lamina cribrosa ohne Excavation der Papille bei einen Glaucoma inflammatorium acutum, *Klin. Monatsbl. f. Augenhk.*, 1900, xxxviii., Beilageheft, p. 47.

[3] Roscher, A., "Ein Fall von glaucomatöse Excavation der Lamina cribrosa ohne Excavation des Sehnerven, *Klin. Monatsbl. f. Augenhk.*, 1901, xxxix., p. 947.

described in the case of Axenfeld-Kruckenberg, and one in which the ætiology appears plain.

The patient was a woman, fifty-three years old. In June, 1900, she presented herself at the clinic of Dr. Hotz suffering with acute inflammatory glaucoma in the left eye. She stated that during the preceding three or four months she had suffered from recurrent attacks of pain in the eye and had at times seen halos around lights. The vision had failed rapidly. Dr. Hotz made an iridectomy. Following this operation there was severe irido-cyclitis. During the next few months there were recurrent attacks of pain and six months after the iridectomy, when the patient came under the care of Dr. Wescott, to whom I am indebted for the tissue and the history, the eye was quiet, the anterior chamber was shallow, the lens was thickened and cloudy, the tension was + 1, vision $= \frac{6}{20}$, and the field was narrowed at the temporal side; the fundus could not be seen. Right eye showed peripheral opacities of the lens, there was no cupping of the nerve head, vision = $\frac{6}{12}$ +, and the field was normal. The tension of the right eye was increased. Under local anæsthesia the swollen lens of the left eye was extracted. The operation was without difficulty, but considerable lens matter was left behind. Three days later the patient was given a general anæsthetic, the wound was opened, and an attempt was made to remove the remaining lens matter. Following this there was severe irido-cyclitis and fifteen days later the eye was enucleated. The tissue was fixed in formalin and imbedded in celloidin. Sections were made in various planes and stained with various stains.

Macroscopically the tissue shows nothing of interest except a detachment of the retina and choroid.

Microscopical examination shows the episcleral vessels engorged and the tissue swollen and full of new cells. The cornea shows the two operation wounds. The wound made for the iridectomy has healed; the wound for the extraction of the lens has only partly healed. In sections

through the closed part one sees the typical picture of a healing wound of the cornea. Around the wound externally there are many lymphocytes, plasma cells, mast cells, and a few polymorphonuclear leucocytes. There is practically no anterior chamber, the iris and cornea being in contact in many places. Some sections show incarceration of the iris in the corneal wound. In the angle of the anterior chamber some sections show adhesion between the iris and the cornea, others show that such adhesion has previously existed but has been partially or totally broken loose. The vessels of Schlemm's canal in some sections are full of blood. The pectinate ligament in some sections is a mass of dense tissue; in others it is more open. The spaces of Fontana are filled with débris and pigmented cells; pigmented cells are also found in abundance around the vessel wall of the circulus venosus scleræ; similar cells are also in the perivascular spaces of the perforating vessels of the limbus. The iris is atrophic and is adherent to the lens capsule. There is a good deal of lens matter present. The lens and the capsule are caught slightly in the wound. Where the lens is caught it shows an increase in cellular elements; in other parts there are degenerative changes. The ciliary body is œdematous, its blood-vessels are engorged with blood, and it shows an increase in cells. The same may be said of the ciliary processes. The choroid is the seat of an albuminous exudate, which is mostly in the external layers and has pushed the internal layers and retina inwards, giving rise to what macroscopically looked like detachment. In places in the exudate there are masses of mononuclear leucocytes. The choroidal vessels are full of blood. The retina shows no marked changes except in the region of the papilla where it is swollen and thickened and pushed away from the head of the nerve as in choked disc (see figure). The head of the optic nerve is most interesting in that the lamina cribrosa is pushed back just as is the case in a marked glaucomatous cup, but there

is no excavation of the papilla. The cup made by the pushing back of the lamina cribrosa is filled with nerve fibres (see figure). In the centre of the papilla there is a slight depression like a physiological cup. There is some increase in cellular elements in the nerve and the nerve fibres are swollen. The interstitial tissue is increased, the blood-vessels are prominent and their walls thickened. There are no "holes" or "caverns" such as Schnabel and others have described in optic nerves of glaucomatous eyes.

Briefly the clinical course of the case and the histopathology may be summed up as follows. Clinically there is the typical history of a rather rapidly developing inflammatory glaucoma. Iridectomy gave some relief but after six months the tension was + 1. Again the eye was operated on and this operation was followed by a severe inflammatory reaction. Twenty days later the eye was enucleated. Anatomically there exists in the anterior part of the eye the conditions which mark an inflammatory reaction of subacute type; posteriorly there is a marked papillitis, and a marked cupping of the lamina cribrosa, but no excavation of the papilla. The nerve shows atrophic and inflammatory changes.

To explain the interesting findings of this case of glaucomatous excavation of the lamina cribrosa without excavation of the papilla, and with marked papillitis, I think we have only to appeal to the not uncommonly observed condition of optic neuritis resulting from inflammations involving the anterior part of the eye, and to consider the clinical history. In the light of these facts it is altogether probable that the course of the process has been as follows: There developed in the eye an acute inflammatory glaucoma with the usual result in the nerve head of such condition, viz., cupping. The tension continued over a period of about nine months, but did not bring about complete atrophy of the nerve. Following the second operation there was kerato-irido-cyclitis and,

resulting from this, neuritis developed in the partially atrophic and cupped optic nerve; this caused a swelling of the tissues, and this, again, filled up the glaucomatous cup and brought about the choked disc appearance. If I have interpreted the findings and the course of this case correctly—and this seems altogether probable and agrees with the views of Roscher—the very rare and interesting conditions presented by this case are as regards pathogenesis very simple.

As is well known, papillitis has been found clinically and anatomically not infrequently in glaucomatous eyes (this case of course belongs in this larger group), and the question may be said to be an open one as to whether, in such cases, the papillitis is an accidental complication or a part of the glaucomatous process. It would not be fair to generalize on this subject from this one case, but it may be said that this case emphasizes the fact that such a papillitis may be a purely accidental complication.

In closing the discussion of his case, Kruckenberg, bearing in mind one of our most important subjects, makes a very important statement which I think can be appropriately quoted here: "Wir werden uns jedenfalls hüten müssen, aus solchen eigenartigen Befunden zu viel für die Pathogenese des Glaucoma schliessen zu wollen."

ILLUSTRATING DR. BROWN PUSEY'S ARTICLE ON "A UNIQUE CASE OF ACUTE INFLAMMATORY GLAUCOMA"

AFFECTIONS OF THE OPTIC NERVE DURING PREGNANCY.[1]

By Dr. ARNOLD KNAPP, New York.

ACCORDING to Groenouw,[2] the optic nerve is not infrequently involved in pregnancy in the form of optic neuritis or of retrobulbar neuritis. Uhthoff found 4 of 66 cases of chronic retrobulbar neuritis to occur in women in advanced pregnancy. Other cases have been published by Kipp, Valude, Power, Lawford, Knaggs, and Ole Bull. Groenouw says that the transient loss of vision in these cases cannot be regarded as uræmic or hysterical amaurosis but rather due to a neuritis secondary to auto-intoxication agreeing with similar ocular disturbances in labor and lactation (Uhthoff[3]).

I have observed 10 cases where the optic nerve and retina during pregnancy and labor showed changes which differ from retinitis albuminurica gravidarum. On studying the general symptoms which accompanied these eye lesions it seems to me that they correspond to two groups, one which is now recognized as toxæmia of pregnancy and the other as sepsis. As the former predisposes to the latter the symptoms are often combined.

I shall briefly report the histories of 3 cases of neuritic atrophy with no other change in eye grounds occurring in pregnant women with other manifestations

[1] Read at meeting of American Ophthalmological Society, Washington, May, 1907.

[2] *Graefe-Saemisch*, second edition, vol. xi., p. 185.

[3] Uhthoff, Thirteenth Medical International Congress, Paris, 1900.

of toxæmia. The other cases which I shall omit were complicated with sepsis, the eye grounds presenting the additional changes of septic retinitis.

Case 1.—Mrs. R. F. Age thirty-two. Seen July 13, 1906, at the Lebanon Hospital by courtesy of Dr. Martin Cohen.

Patient gives a history that she has had five children in a period from eleven to five years ago. She then had four abortions. She is now in the eighth month of pregnancy. Seven weeks ago suffered from severe headache and vomiting. Five weeks ago the right eye became blurred, which was shortly followed by an involvement of the left, and in one week both eyes were blind. She has had no convulsions. The headache and vomiting have ceased. Urine examination shows specific gravity 1.020; faint trace of albumin; proportion of urea nitrogen greatly reduced.

On Examination—Both pupils widely dilated and immobile; no perception of light in any part of the field. Both optic disks are white; outlines indistinct. Arteries narrow. There is some œdema of the retina in the macular region. On July 20th labor was induced, and a dead child delivered. Mother died of septicæmia.

Case 2.—Lying-In Hospital, Oct. 4. 1904. In preceding pregnancy there was loss of sight becoming worse after labor for three weeks, then improved, but complained of asthenopia. At present in eighth month of pregnancy complains of blurred vision. Albuminuria. The optic nerves are white and ill-defined. Field normal.

Case 3.—Seen at the Lying-In Hospital, August 12, 1904. Primipara. Three months ago her vision was blurred for two weeks. She then had headache. Now near term the legs are swollen; the urine contains some albumin; optic nerves distinctly white. Right: blurred, nasal half swollen. Left: flat, vision and field normal.

According to Stone[1] the evidences of toxæmia of pregnancy are as follows: In the early months nausea and vomiting; skin manifestations (urticaria). These conditions are all observed in normal menstruation. During

[1] "Toxæmia of Pregnancy," by W. S. Stone, M.D., *Amer. Gyn.*, Dec. 1903.

the later months there are headache, loss of sight, vomiting, vertigo, neuralgic pains, œdema. The urine may contain albumin and casts. This may be followed by convulsions and coma, rarely patients will become totally blind, comatose, and die.

It is now generally accepted that hyperemesis gravidarum and eclampsia are expressions of a toxic state in which the liver is the seat of the chief lesion, often presenting the same changes as acute yellow atrophy. During the period of lactation there may be a continuation of this state of the system, and these symptoms may consequently persist. One of the most frequent is the insanity.

Chemical examination of the urine by Ewing and Wolff, *American Journal of Obstetrics*, April, 1907, has shown that there is a disturbance in the nitrogen ratio. The total amount of nitrogen is decreased. The nitrogen which is converted into urea is decreased, while the other nitrogen derivatives are increased.

In the fatal cases post-mortem examination has shown parenchymatous multiple neuritis (Lindemann) and acute degeneration of the liver.

The ophthalmoscopic condition found in my cases at the time of examination was neuritic atrophy. Whether a central scotoma was present at the beginning cannot be determined as no case was seen in the early stage. The vision is frequently regained, or it remains defective with peripheric contraction of the field and in the most marked cases the eyes are permanently blind.

There can be no doubt that this ocular condition is found with the symptoms of toxæmia of pregnancy and in the absence of other causes it can be safely assumed that an etiological connection exists. I have been impressed by the frequent appearance of pale optic nerves in women, often with normal vision, who have borne children; may this not be the evidence of some toxic influence during preceding pregnancies?

NAIL FROM A SHOTGUN CARTRIDGE, WHICH SPONTANEOUSLY CAME OUT FROM UNDER THE EYELID, WHERE IT HAD BEEN LODGED FOR EIGHT YEARS, WITHOUT ANY DAMAGE TO THE PATIENT.

By Dr. J. SANTOS FERNANDEZ, Havana.

(*With three illustrations on Text-Plate III.*)

Mr. M., a pharmacist fond of weapons and hunting, consulted me for the first time on Jan. 26, 1895. At the fencing club he had slightly hurt his right upper eyelid on the skin of the internal third of the free border and superficially the bulbar conjunctiva of the internal angle. The accident had no consequences, and he was cured in a few days.

July 28, 1899.—On this date, a new accident in the same right eye induced him to consult me again. Two days before, while firing a Lefaucheux shotgun a cartridge charged with white powder and shot exploded. The proper size of the cartridge may be appreciated by examining Fig. 1. The explosion only caused him a slight bruise of the upper part of the right orbital border towards the external end, where slight superficial traces were to be found. The vessels of the bulbar conjunctiva at the external angle of the right eye were slightly injected. Hardly any trouble was experienced by the patient. Little importance was attached to the traumatism, and the presence of a strange body with absence of all kind of trouble was not suspected. We prescribed an antiseptic pomade with sulphate of duboisin, in order to prevent any inflammatory reaction in the inner part of the eye, which happily did not occur.

August 22, 1899.—On this date, twenty-five days after

the accident referred to he suspended the use of the medicines prescribed because he felt well. This time he consulted me, because he believes that he cannot see well with the right eye, adding that he has no doubt whatever about the matter because he is a hunter and has occasion to prove it in his constant practice.

The examination of his visual powers did not confirm his opinion. Each eye separately examined showed the maximum of sight at a distance. There was nothing in the fundus of the eye. He insisted, however, on an obscuration, always present in the right eye; this was attributed to slight hyperæsthesia of the retina without any importance, and the usual hygienic treatment was prescribed.

September 10, 1907.—The patient was not seen again for eight years and he stated that during all this time he had not been troubled in the least with the exception of flies that occasionally passed before his eyes.

Dr. Hector, his family physician, however, says that he was consulted on more than one occasion on account of a certain "little ball" which could be felt on rubbing the external angle of the right eye. Dr. Hector never examined him, always suggesting that he consult an oculist. But he continued rubbing his right eye daily. The morning of the day on which he consulted me, before leaving his bed, he experienced, as on other occasions, a certain trouble in the right eye, and a strange sensation, which at other times, passed off in a few minutes. This time it was a little stronger, with pain. The uneasiness and pain increased, and, jumping out of bed, he stood before the mirror. As well as he could, he raised the external third of the right upper eyelid, and he immediately noticed that something appeared at the external angle and under the upper eyelid (Fig. 2). On closer examination, he saw something coming out, like the fragment of a hairpin, such as is used by ladies, which finally fell upon the washstand. He picked it up, thinking at first that it might be something that he had got in under the eyelids while in bed, like a hairpin belonging to his wife. But he was not long in discovering that it was one of the nails of the cartridges used for the Lefaucheux shotguns (Fig. 3). He picked it up and immediately came to see me.

The nail referred to is seen in Fig. 1. It is about *2cm* long and from 3 to *4mm* in diameter. It had been lodged under the upper eyelid. There it was that the vessels were found more injected than in the other eye, and there was a certain infiltration of the tissues. All this was not what was to be expected from the lodgment there of a strange body of such dimensions.

Were it not for the fact that the patient is a serious and honest man and not a weak woman given to hysteria, I should be inclined to think that the whole case was a deliberate deception. But the lodgment of this strange body under the eyelid during eight years is not a surprise to me. I have seen and published[1] several cases of the lodging of strange bodies in the eye, one of them for eleven years. The only rare thing about this one is the fact that it hardly caused the patient any trouble, and had come out of itself without leaving the inflammatory reaction to be expected in such cases.

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[1] "Intraocular Ossification of a Strange Metallic Body," by Dr. J. Santos Fernandez, *Cronica Medico-Quirurgica*, vol. vi., p. 455, 1860; *Archives of the Havana Society of Clinical Studies*, vol. ii., pp. 140, 151.

"A Sharp Piece of Steel which Remained during Eleven Years within the Eye next to the Optic Nerve," by Dr. J. Santos Fernandez, *Revista de Medicina y Cirurgia Practicas*, Madrid, vol. xxi., p. 246.

"The Eye Wounded by Shot," by Dr. J. Santos Fernandez, *Cronica Medico-Quirurgica*, vol. xii., p. 419; vol. xx., p. 121.

"Spontaneous Expulsion of a Strange Intraocular Body," by Dr. J. Santos Fernandez, *Cronica Medico-Quirurgica*, vol. xii., p. 339.

ILLUSTRATING DR. J. SANTOS FERNANDEZ'S ARTICLE ON "NAIL FROM SHOT-GUN CARTRIDGE IN EYE"

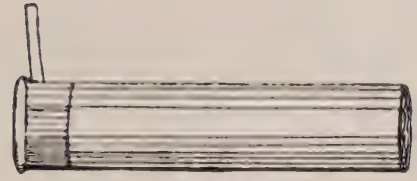

FIG. 1

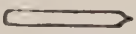

FIG. 3.

FIG. 2.

INTERSTITIAL KERATITIS AFTER THE USE OF CALMETTE'S OPHTHALMO-REACTION.[1]

By Dr. ARNOLD KNAPP.

THOUGH many reports on the use of Calmette's test have already appeared in medical literature, an unfavorable result to the eye has apparently not been observed. Even in the two recent publications on the value of this reaction in Ophthalmology by Franke (*Deutsche med. Wochenschr.*, Nov. 28, 1907) and Stephenson (*Ophthalmoloscope*, Dec., 1907) no untoward effects to the eye were observed except follicular conjunctivitis in three of the latter author's cases. Kalt at the meetings of the Paris Ophthalmological Society on Oct. 7 and Nov. 5, 1907, spoke of a patient with quiescent sclero-keratitis in whom two days after the ophthalmo-reaction with one per cent. tuberculin solution the ocular inflammation became aggravated with iritis and increasing corneal involvement. The severe symptoms continued for one month and sight was reduced. Kalt emphasized the danger of the use of the ophthalmo-reaction in a tuberculous internal eye-trouble.

In the following case a typical tuberculous interstitial keratitis in a previously healthy eye followed the instillation of the tuberculin solution which produced severe local and general manifestations.

The patient, a girl, nine years old, of healthy German

[1] Patient presented at the meeting of the Ophthalmological Section, New York Academy of Medicine, January, 1908.

parents recently landed in this country, came to the New York Ophthalmic and Aural Institute on account of a scrofulous superficial keratitis in the right eye of two months' duration. Of eight children five have died; one at the age of four days, twins at two days, one premature birth, one of meningitis at ten months. The three living children have always been healthy. This one is blond, fairly well developed, with no enlarged glands, or joint or bone involvement. The right cornea presents a central broken-down superficial infiltration. Photophobia marked. Nose and throat normal. The child was treated in the hospital and but little progress was made with the usual remedies. An ulcer formed on the lid margin and proved very resistant to treatment.

On Dec. 14th, one drop of a one per cent. tuberculin solution (obtained from the New York Board of Health Laboratories by the courtesy of Dr. W. H. Park) was instilled in the left eye which had never been affected. Six hours later the lids were very red and swollen, and the child complained of great pain. During the following two days the local condition remained about the same, the lids could be separated with difficulty, there was a thin muco-fibrinous discharge which microscopically showed no organisms. The general reaction was marked; the temperature rose to 100.4° F. With cold applications, irrigations with salt solution and argyrol the local symptoms abated, but the conjunctiva remained red and thickened. About ten days later corneal infiltrations appeared. These were arranged in three groups near the temporal margin, consisting of discrete infiltrations situated in the superficial layers of the corneal stroma with new-formed blood-vessels, the overlying epithelium being somewhat elevated. The infiltrations have now (January 28th) coalesced, forming three yellowish-gray patches 2–3*mm* in diameter; they are surrounded and partly covered by characteristically straight deep-seated corneal blood-vessels. The overlying corneal epithelium is smooth. On the pupillary side of these patches a number of discrete grayish infiltrations are visible, indicating the progressive extension of the process over the cornea. The conjunctiva is smooth and moderately injected and there are no gross lesions in the iris or in the angle of the anterior chamber.

This is a typical tuberculous process in the cornea and as it came on after the use of the tuberculin solution in a previously healthy eye, a connection seems very probable. This unfortunate case demonstrates that the ophthalmo-reaction cannot be regarded as harmless.

OXIDE OF COPPER IN THE CORNEA.

By Dr. EDWIN G. RUST, Cleveland.

THE possibility of being struck in the eye with oxide of copper while walking or driving in the public highways did not exist until that period of the present age when the overhead trolley wire system was introduced into use as a means of conducting and applying the electric current as a motive power. As the wheel of the trolley pole runs over the plates of which the hangers and switches are made, there is always some combustion. Ordinarily this is invisible and insensible, but under any influence which makes poor or interrupted contact, the copper is detached, immediately oxidized, and thrown off in brilliant sparks. The substance of the sparks thus emitted is always oxide of copper, except when there is some mechanical abrasion on the wire or on the hanger, in which instance the spark substance consists of either pure copper from the wire, or a poor grade of bronze from the trolley wheel. The substance of these sparks occasionally strikes the cornea, and always becomes deeply imbedded. I may have removed this substance without knowing its character prior to my first recognized case, which occurred nine years ago. The foreign body in the following cases was oxide of copper; no trace of pure copper or bronze being present.

A lady came to my office suffering acutely from "having just been struck in the eye by a spark from a trolley wire" as

she was "driving her automobile alongside a street car which was running under a number of intersecting wires."

On examination I found a brownish-black circular body about 1*mm* in diameter, smooth on its outer surface but with its under side raggedly spreading into and beneath the corneal epithelium. To the contact of my instrument the foreign substance seemed like half rotten rubber. It was very clinging and difficult to remove, the substance seeming unusual to me. I submitted the foreign body to an expert for examination. He found it to be oxide of copper.

Since this case my records show that twenty-six other persons have come to me with oxide of copper in the cornea. Twenty-five came with the statement of having "been struck in the eye by a spark from a trolley wire." One, that "he had in his eye a spark which flew from the wire of a travelling electric crane." In four cases the copper had been imbedded in the cornea for more than a week before the patients had consulted me. In none of these cases was there any tendency to ulceration.

Oxide of copper is a body which does not scratch, as it is smooth, and often is almost buried beneath the epithelial cells. The ciliary injection, pain, and photophobia are intense, until every vestige of the copper is removed. Oxide of copper must have been in the past few years frequently removed from the cornea, and perhaps its character, composition, and mode of formation recognized; but so far as my research extends, it has not hitherto been reported, or described. I have reported these cases more as a matter of scientific interest than of clinical value.

PARTICLES OF GLASS AS FOREIGN BODIES IN THE LENS.

By Prof. LAQUEUR, Strasburg.

Abridged Translation from the German Edition, Vol. LIII., No. 2, Nov., 1905, by Dr. Ward A. Holden.

FOREIGN bodies in the lens are of the greatest rarity if we understand by this designation such only as are imbedded in the lens and do not project into the anterior chamber or the vitreous. Mooren (1) in 10,000 cases of eye disease found this condition but once, and about the same ratio existed in the ophthalmic hospital at St. Petersburg (2), namely, 13 cases among 109,153 patients. Other observers have reported a higher ratio, Hirschberg (3) finding 14 cases among 58,000 patients, a percentage of 0.02; but all agree as to the great rarity of the condition.

This rarity is not surprising for there must be peculiar conditions to permit the entrance of a foreign body into the lens and its remaining there. It must naturally be small and must have a low kinetic energy. If it is very small, it remains frequently in the cornea or becomes imbedded in the iris; if it is large it usually passes through the lens deeper into the eye. But rarely is its energy exactly of the degree that causes it to remain in the lens.

When we consider the chemical composition of the foreign bodies we find, as with foreign bodies in general, that iron occupies the first place, comprising about two thirds of all. The remaining third includes particles of

stone, of copper such as fragments of gun-caps, splinters of bone, granules of carbon from powder injuries, and even a large particle of lead was found in the lens by Pamard (4).

Greeff reported at the Heidelberg meeting of the year 1904 that in the lenses of fishes and even in the human lens he had found trematodes which had led to cataract. It is noteworthy that in the accounts the presence of bits of glass is almost unheard of, although injury of the eye by glass from broken spectacles or bursting glass vessels is quite common. I find in E. Praun's book on injuries of the eye only a single case quoted from Post (5), that strictly speaking does not belong here since the splinter of glass, which was *9mm* long and lay in the lens, projected into the vitreous and later fell into the vitreous chamber.

Among thousands of cases of injury of the eye I had the opportunity twice of seeing splinters of glass in the lens. The case histories follow:

Case 1.—P. H., a student aged 20, was injured in November, 1874, by the bursting of a glass flask containing nitroform, in aqueous solution, in the chemical laboratory of Zurich. Pieces of glass flew into each eye, so damaging the right eye that it was at once enucleated by Prof. Horner. In the left eye there was only a small perforating wound at the inferior margin of the cornea through which a tiny splinter had passed, perforating the iris and entering the lower portion of the lens.

Five months after the injury I saw the patient for the first time and after dilatation of the pupil discovered a small irregular bit of glass sharply defined in the lower portion of the lens near the equator. The eye was entirely free from irritation and exhibited nothing abnormal save the scarcely visible scar at the lower limbus. With —1.25 D vision was normal.

The eye remained in this condition for three years and a quarter, when the lens began to become opaque about the foreign body and the opacity spread about the cortex, leaving the nucleus clear. Five years after the injury Prof. Horner made a preliminary iridectomy and a discission and some

weeks later did a flap extraction downward. The *lens was removed entirely* and with it the bit of glass. Normal vision was obtained and there was no difficulty later.

Case 2.—A girl of 21 presented herself at the clinic Dec. 21, 1901, two weeks after having the right eye injured by glass from a shattered window. Some bits of glass lodged in the conjunctiva and were removed by a physician. The eye continued to be troublesome and she came to the clinic. Externally there was a moderate injection of the bulbar conjunctiva on the temporal side and a small splinter of glass on the surface of the cornea below, which was readily removed. Otherwise the eye appeared normal and the vision was normal. By careful examination one saw in the white of the eye *2mm* external to the temporal margin of the cornea a small scar above which the conjunctiva was reddened and swollen. The cornea and iris were normal, but after the pupil was dilated a transverse linear opacity was seen in the lens running from the outer portion of the equator to a point somewhat behind the centre of the lens and at its central end there was a small, irregular gleaming spicule of glass which must have lain in the axis of the lens between its centre and its posterior pole. The small wound in the conjunctiva and sclera healed and in a week no trace of it could be seen.

Three months later I saw the patient again. She then complained of a slight disturbance in vision and although the acuteness was normal there was some polyopia and when a luminous object was fixed four or five images of it were seen. When a horizontal stenopaic slit 1.5*mm* broad was passed slowly from above downward before the pupil, above there appeared one image of a flame, through the middle of the pupil four or five images, and through the lower part of the pupil one image again, showing that the polyopia must arise from the refraction of light through the prismatic bit of glass. When a slit as narrow as 0.5 *mm* was before the middle of the pupil the polyopia ceased, indicating that the slit was then narrower than the vertical diameter of the piece of glass. Vision was now reduced to 0.5 and the hyperopia had increased to 2. D. The reduction in vision was not to be explained by the objective examination, the lens showing no increased opacity and the foreign body occupying its previous location.

Eight months after the injury the eye was examined again. Vision and hyperopia were as before, the lens about the foreign body exhibited fine opacities, and the accommodation was reduced. While in the uninjured eye there was a range of accommodation of 7.5 D, in the injured eye this was only 5.5 D.

Ten months after the injury the conditions were as before and since then the patient has not come under my observation, but three years and a half after the injury the vision, according to her physician, had not become further reduced. Will the vision remain good permanently? My experience in Case 1 would lead me to believe that it will not.

From Leber's investigations we know that aseptic foreign bodies in the lens cause no inflammatory reaction so long as they do not become dissolved or decomposed and that even copper may remain innocuous here, whereas it sets up a purulent inflammation when it comes in contact with vascular structures.[1]

Foreign bodies of iron when aseptic may remain a long time in the lens without causing injury, but gradually they become oxidized, and cause siderosis of the lens.

We have had no information as to the conduct of glass splinters in the lens, but Case 1 is instructive. For three years and a half the splinter remained inactive and then a cataract began which required a year and a half further for its full development. It cannot be doubted that the formation of the cataract was due to chemical changes in the glass, for glass is not so insoluble as it is supposed to be. Glass eyes exposed to the influence of conjunctival secretion are known soon to become roughened.

It seems justifiable, therefore, to suppose that in Case 2 after some years total cataract will develop.

Splinters of glass may long remain in the cornea also

[1] There are many cases on record of splinters of copper in the lens without general opacity. *Cf.* Warschauki, Z. "Casuistik d. Linsenverletzungen d. Kupfersplitter," *Ophth. Klinik*, 1905, p. 20.

without causing reaction or local changes. Thus Magnus (6) reports that he removed from the cornea of an elderly woman a splinter *2mm* long and *0.5mm* broad which had become imbedded 27 months before on the bursting of a soda-water bottle. This foreign body projected slightly above the surface and scratched the lid when the patient closed her eye. Vision was normal as were the other functions of the eye. And I have myself removed bits of glass that had remained in the cornea respectively seven and eight months without producing irritation.

It is worthy of note that cilia, bodies of organic nature, may become healed into the cornea without causing reaction. And not infrequently they are found in the anterior chamber. Vieweger (7) in 1883 collected no less than 29 cases of this sort. In some of these there was no reaction, while in others there was inflammation or the formation of cysts of the iris. I have seen two cases in which a cilium healed into the cornea without causing reaction. In one case a man was injured by a bit of stone in the infero-temporal quadrant of the cornea. Two days later a small ulcer with hypopyon developed here and healed leaving a round scar. Three months later a lash at least *5mm* long was found imbedded in the cornea and extending beyond the margins of the scar. Vision was good and in the absence of any signs of irritation extraction was not deemed necessary.

In the second case a child of three had fallen and cut the eye with a piece of sharp tin. There was a flap-shaped wound in the supero-nasal quadrant of the cornea. When examined 19 days after the injury the entire quadrant was cloudy, very vascular, and a little prominent. In the opaque portion of the cornea lay a cilium about *6mm* long. It was near the inner limbus and lay obliquely in the cornea so that its lower end was near the anterior epithelium and its upper end near Descemet's membrane. The foreign body had caused no trouble, which is the more singular since the lashes are not aseptic.

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A CONTRIBUTION TO THE KNOWLEDGE OF XERODERMA PIGMENTOSUM.

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Translated from Vol. LXVI., No. 3, of the German Edition, by Dr. Percy Fridenberg, New York.

(*With Appended Plates X.–XII.*)

ON November 13, 1901, Dr. Költzsch, Frankenberg, had the kindness to send to me for ophthalmoscopic examination two of his patients, sisters, by the name of X., who were affected with a rare and interesting disease, xeroderma pigmentosum of Kaposi. The clinical history in regard to the family conditions, which are of great importance in this affection, showed that the grandfather of the children, Mr. X., is still alive and in good health. Their grandmother X. died at the age of 50. The grandparents on the mother's side are both living at an advanced age, and some years ago celebrated their golden wedding in perfect bodily and mental vigor. The father of these two girls, Mr. A. X., died at the age of 42 of what was said to be nephritis. The mother, aged 41, a Y. by birth, is perfectly well, and the independent head of a business. Four children in all were born of this marriage. One of these, a boy, died at the age of 4 years of a heart lesion; the other, now 14 years of age, is perfectly well, and normal in every respect. Mr. B. X., an uncle, now 51 years old, married a sister of Mrs. A. X.—that is, also a Y. by birth, and she is now 50 years of age. This couple is perfectly healthy. Besides numerous miscarriages,

Mrs. B. X. has had seven living children, of whom two died at a very early age. In addition, one girl died at the age of 12 of xeroderma pigmentosum. A boy of 17 and a daughter of 21 are healthy in every particular. Two other daughters, however, aged respectively 14 and 24, are affected with typical xeroderma. There is a third Mr. X., who married a third sister, born Y. Both appear to be perfectly healthy, and have three healthy sons and two healthy daughters. Four daughters of one sister of the Y. family are married and live abroad. The latter is married, but not to one of the X. family. Of the four brothers, two have healthy children, and one has none; one is unmarried. The fourth Mr. X., living abroad, is also married, but not to one of the Y. family; and is said to have eight healthy children. Both families, X. and Y., are of Jewish race, but there is no blood relationship between them as far as they know their genealogy.

Case 1.—The elder of the two first mentioned sisters X., S., aged 13, was born perfectly normal, and just as sound as other children, according to the statement of a very intelligent and careful mother, who particularly states that there was nothing specially noticeable about the color of the skin until the end of the first year. After this, however, she noticed that each time the child had been carried out into the open air numerous small, red dots appeared on the uncovered parts of her neck, hands, and forearms, "as if the skin had been pricked with needles." Soon after, innumerable, dark brown freckles appeared on the skin of the parts above mentioned, so that at the end of three years a physician was consulted on account of this remarkable appearance; and he made a diagnosis of xeroderma. The freckles gradually became so numerous that hardly a spot of normal skin remained between them. At about the fourth year areas of white appeared between the pigment spots, in the neighborhood of which large blood-vessels developed of sufficient size to be noticeable even to the lay eye. These areas gradually increased in number and extent. Since the sixth year there was also a marked roughness of the skin, which

falls off in small and large scales, associated with ulceration at many points on the face and neck. The ulcerations are generally not larger than a one cent piece, are not very deep, and at first bleed frequently, but finally become covered invariably with an excessively dense, horny layer, often more than one-tenth of an inch thick. Under it they gradually heal so that eventually no trace is left except a large parchment-like, but not indrawn, scar.

Simultaneously with the formation of scales, fissures appeared occasionally at the angles of the mouth and on the lips, but they always disappeared in time. The most annoying symptom for the unfortunate child was the photophobia from which she had suffered since the first appearance of the freckles. Later on, marked lachrymation supervened, and vision in both eyes became affected.

In regard to treatment, the mother claims that everything possible has been done. Almost all the prominent dermatologists in Germany have essayed their skill in the case. Besides external and internal use of drugs, and surgical procedures, trials have been made with red veils, yellow light, and so forth, but without any appreciable effect. The child has also been treated in eye-clinics and has been subjected to operations.

Physical Examination.—The general condition is very good. The girl is large, broad-shouldered, and the internal organs are normal. The skin covering, where it is not affected by the disease, might be called luxuriant; but scattered over the entire area there are found individual small pigment spots. The scalp is normal, the hair dark brown, and the iris of both eyes is light brown. The buccal mucous membrane is intact. The patient's intelligence corresponds to her age, and her will power is excellent.

The pathologic changes in the face can mostly be seen quite clearly on the photograph. On the tip of the nose, the cheeks and the upper lip particularly, marked ulcerations can be seen with thickened edges and fissured base, mostly covered with dark brown, dried secretion; and in addition a number of small and larger warty excrescences on the skin attract attention, all of which are in the nature of hyperkeratoses. Some of them can easily be scratched off with the finger nail.

When this is done, there sometimes appears under the horny layer an ulcerated surface like those described above, the margins of which, however, have invariably begun to cicatrize and epidermidize. The latter process, for instance, had taken place in the two large tumors on the bridge of the nose, below the left eyebrow. A large warty growth was found in the skin at the entrance to the right external auditory canal, and several ulcerations on the ear itself. The photograph shows a shiny white appearance on the bridge of the nose, the cheek-bones, the upper lip, and the region above the eyebrows. To the touch these portions of the skin are hard and thin, like parchment. The skin is tightly stretched, as if too short, so that it can hardly be moved about on the underlying muscle and bone. The yellowish-brown pigmentation of the whole skin is well shown in the picture, but the few small areas of normal color are hardly to be seen. This also applies to the numerous reddish spots which are found in the neighborhood of the atrophic skin, and which represent angiectases. A correct impression of the unique, variegated clinical picture would require a colored photograph or an artistic painting. The illustrations in color which accompany the works of Pick and Lukasiewicz do not appear to me to be very successful. At least, they do not correspond entirely with the text. The backs of the hands and forearms are strongly pigmented and rough, but the palms are free as are also, be it specially remarked, the feet and ankles, which have always been kept covered. The girl hangs her head constantly on account of the photophobia, and her constantly tearing eyes are half closed. Closer examination shows that the lid margins are much reddened, and have partly lost their lashes. In the left eye there is a slight ectropion, and in the right, entropion of the lower lid. The conjunctival sacs are markedly shrunken —one might say, entirely obliterated; particularly on the right side, where a broad band of scar tissue runs outward from the margin of the lower lid to the limbus of the cornea. Small cicatricial strands run on both sides from the caruncles to the inner margin of the cornea. The latter is infiltrated with numerous small, deep-seated opacities. The fundus is normal. The vision is: right eye $\frac{5}{50}$; left eye $\frac{5}{15}$; with correction. Therapeutic measures for the eye condition were limited to medica-

ments. No noticeable change for the worse had occurred up to May 12, 1902.

Case 2.—The younger sister, R., is a delicate girl of 7, very small for her age, with poorly developed adipose tissue and small bones. There is no evidence of organic disease; appetite, etc., satisfactory. The hair is dark brown; the eyes, light blue. On account of her sad experience with the elder child, the mother says that she protected R. from light and wind as much as possible from the start, and that red spots on the skin did not appear until the third year. The other symptoms, too, were milder and more insidious in their onset, than in the case of the older daughter, although quite analogous.

As shown by the photograph, the disease does not appear to have advanced very far: there is not much to be seen of ulceration or fissure formation. Ulcerations are to be seen only at the inner angles of the eyes, and on the lower lids, which were at first covered with thick layers of epidermis, then ulcerated, and finally healed. The skin on the bridge of the nose and on the cheek-bones, however, has already undergone parchment-like degeneration. The entire face and the ears are intensely pigmented and covered with warty nodules and horny scales. The neck has not been affected, probably because it was always kept covered as much as possible, whereas the elder daughter had been allowed to wear low-cut dresses. The brow, too, which has been kept covered by specially arranged curls is free, as is the scalp. The lower arms and the backs of the hands are covered with dark brown spots, but the palms are free. The legs and the rest of the body are normal, but in one or two places faintly pigmented nævi are found. The condition of the eyes was extremely interesting. There was only slight photophobia. The lashes had partly fallen out. There was slight ectropion of the lower lids. The conjunctival sac was preserved. In the left eye a cicatricial band, plainly visible in the hyperæmic conjunctiva, ran from the caruncle to the cornea. At a corresponding point of the right eye there was a tumor of the size of a small bean, reaching on the temporal side to the inner margin of the cornea, and on the nasal, to within 3*mm* of the caruncle. The conjunctiva covering the tumor was slightly injected, but freely movable. The tumor

itself was soft to the touch, and not movable on the sclera. A parenchymatous opacity of the cornea ran from the inner margin to the middle of the pupil. Ophthalmoscopic examination was negative. V, O D, $\frac{5}{60}$; V, O S, $\frac{5}{6}$.

On Nov. 22, the tumor having become no smaller, and the corneal opacity having progressed, operative removal was decided on. Under chloroform anæsthesia, the new growth was removed piecemeal, until scleral tissue could be seen. Finally the entire wound surface was burned with the actual cautery as thoroughly as possible. Normal healing took place. On January 25, 1902, there was nothing more to be seen of the operative wound, but a large pseudopterygium had formed, which later on shrivelled up, and finally presented the appearance to be seen on the photograph. On May 12, 1902, the cornea was decidedly clearer than before, at least as to the pupillary area. No relapse had occurred during the seven months following operation.

Case 3.—The two sisters of Mr. B. X., who are in the care of a local oculist could unfortunately be seen only once on January 25, 1902, and to my regret no photograph was taken. In the absence of the parents it was impossible to get any reliable data as to the family history, which seemed to be quite similar to that of the cousins. The younger daughter, aged 12, is a well-developed and healthy child. The skin of the face, neck, hands, and forearms is like that of a mulatto. Close inspection alone shows small areas of white skin between the dark-brown freckles. The formation of warts and the epithelial desquamation are very slight. There is no trace of eczema or of ulceration. Only a small area of skin on the cheek-bones is white and parchment-like, with a few red spots in the vicinity. The piebald appearance of the two cousins is as yet absent. The lid-margins and cilia are still intact, as are also the conjunctiva and the fornix-folds except for the formation, in both eyes, of cicatricial strands running from the caruncle to the limbus. The corneæ are clear. There does not appear to be much photophobia, as the children are seen playing with their schoolmates in the sunny streets, unprotected by dark glasses.

Case 4.—The elder daughter of Mr. B. X., aged 23, presents a picture of advanced xeroderma. She has undergone surgical

treatment in numerous skin-clinics. The general condition is not satisfactory. The patient is emaciated, timid, and very hysterical. The skin of the nose, cheeks, and brow is shiny white, dry, of typical parchment consistency, and bound down. The bony and cartilaginous structures of the nose, covered only by the tense and paper-thin skin, and entirely devoid of padding, give an uncanny impression, as of a skeleton. The ears have a similar appearance, and look like an anatomical specimen dissected to show the cartilaginous framework. The nostrils are much contracted by the shrunken skin, and are ulcerated, as are also the angles of the mouth, where a weeping eczema and fissures appear. The chin and parotid region are covered with dark brown freckles, likewise the neck, forearms, and backs of the hands, the palms remaining free. Epidermis scales and warty growths are less marked than in the case of the two other children. The rest of the body was not examined. The eyelids and neighboring parts of the skin are white and shiny, and have a parchment feel. There is an extensive blepharitis with partial loss of cilia. There is slight ectropion of the left lower lid, said to be the result of an operation performed six years before for the removal of proud flesh. There is rather marked ectropion of the left lower lid. The conjunctivæ and fornix-folds are well preserved, but here, too, cicatricial bands are seen, in the conjunctival tissue of both eyes, running from the caruncle to the inner margin of the cornea. The right cornea is clear, the left, studded with opacities, and surrounded at the margin by numerous small ulcerations.

In view of the fact that few ophthalmologists are well posted on the subject of xeroderma, a review of the theories held by dermatologic authorities as to the nature of this mysterious and unique disease may be in place, as a supplement to the article by R. Greeff in vol. xlii., of these Archives.

According to Kaposi, who first presented this disease to science as xeroderma pigmentosum in 1870, there is first a development of small angiectasies and pigment spots, followed by degeneration and disappearance of the blood-vessels. In this way there are formed numerous

shiny white, atrophic pits, suggesting the scars of smallpox, with a general shrinking of the skin, over which the epidermis becomes detached, and wrinkled. The skin-changes are complicated by eczema, fissures, and ulceration, contracture of the mouth and pharynx, and ectropion of the lower lids, with xerosis of the cornea as an occasional result. In most of the cases, of which Lukasiewitsch collected 76 up to 1895, carcinoma, sarcoma, or angioma, with occasional metastases in internal organs, develops at about the third or fourth year, or later on between the twelfth and twentieth year, at various points of the face, lips, nose, eyelids, cheeks, and auricle. Kaposi considers the process an atrophy of the skin with pigment formation, distinguished from ordinary congenital nævi by its rapid and progressive course and the continuous atrophic metamorphosis of the tissue. The histological changes consist in a proliferation of the papillary connective tissue and of the endothelium of the vessels with consecutive shrinking and degeneration, on the one hand, and, on the other, in a new-formation of vessels and proliferation of pigment, prolongation of the Malpighian body into the depths, dilatation of the glands, and degeneration of the epithelium. It is evidently this displacement in the development of the epithelial structures which gives rise to the remarkable development of carcinoma in such youthful individuals. The condition might be looked upon as one of pre-senility. "Whereas similar changes originating in nævi, as a rule develop imperceptibly in the course of a long life, until at an advanced age they follow a more rapid tempo, and, favored by senile degenerative changes in the tissues of the cutis, in the form of atypical outgrowth of epithelium and endothelium, lead to the formation of carcinoma, the same process, in xeroderma, begins in early childhood, and progresses rapidly to the end."

The ætiology of these anachronistic processes is to be found, according to Kaposi, in "congenital anomalies of

development and vegetation in the papillary layer, its vascular and pigmentary portion." The disease occurs generally among members of the same family, almost always in females. In one instance, seven sisters were affected. Kaposi does not consider sunlight of any more importance, ætiologically, in this affection than it is in the causation of freckles. Unna, whose work Kaposi seems curiously enough to have entirely overlooked, entertains views which are at variance with those of the latter on important points. He describes the clinical course of the disease about as follows: In the course of the second year, when the children first go outdoors, distinct erythrodermia develops, characterized by spotty and diffuse hyperæmia and œdema of the skin, and roughness of the surface. When the patients are three or four years old, the pigmentation becomes more marked, and there is a formation of scales and warts. At the same time conjunctival hyperæmia and photophobia appear. The sixth and seventh years form the acme of the disease, with the development of pearly white, shiny areas in the skin, traversed and surrounded by dilated veins (telangiectasies), particularly on the bony parts of the face—cheek-bones, nose, and ears. At the same time the warty structures become more numerous, serving as a basis for the later development of carcinoma, sarcoma being very rare. There are no glandular swellings. According to Unna the stage of hyperæmia has not been investigated, but studies of the later developments are numerous. The pigment masses are deposited at first in the lowest layer of prickle-cells of the cutis, while at the same time all the connective-tissue elements of the cutis (endothelium, perithelium) become inflamed. No hemorrhages or extravasations are found. From this fact Unna concludes, in agreement with Neisser, that the pigment is melanotic. Masses of pigment are found in the papillary body, but not in the neighborhood of blood-vessels. It also appears in the more superficial layers of the epidermis,

partly intracellular, partly in the interspaces. The cell-bodies are invariably altered to a marked degree. At the same time the nuclear layer broadens while the stratum corneum becomes thickened. It is this hyperkeratosis which causes the marked roughness of the skin. The third stage is characterized by the formation of actually rind-like layers on the epidermis, while the deformation of the prickle-cells becomes still more marked. The papillary body becomes thickened by a further increase in the number of the connective-tissue cells; pigment is accumulated more and more thickly in the lymph spaces, although the connective tissue, which is more resistant to pigment invasion than the epithelium, does not undergo pigment degeneration. "The warty excrescences lie in the papillary body. They consist of cells with well-formed oval nuclei, the walls of which are lined with rows of pigment granules. At many points of these pigmented cell-masses irregular winding cavities are to be seen with pointed prolongations, which are exactly like the dilated lymphatics of the layer immediately above, that of the prickle-cells, which is in a state of pigment degeneration. If these data were not sufficient to show the epithelial character of this cellular new-growth, direct proof would be given by the appearance, at only a few points it is true, of epithelial strands entering the cell-masses without any distinct boundary." According to Unna, the carcinomatous proliferation begins at the surface. Where under low powers the new-growth looks like a pigmented sarcoma, and has not arisen from the surface, the origin is to be found in nævi, originally present, and pigmented by the xeroderma. The white areas show a complete loss of papillæ and superficial capillaries. The telangiectasies are formed by collateral stasis, not by newly formed vessels.

Unna considers the entire process one of sclerosis rather than atrophy; the epidermis and collagenous tissue is hypertrophied, and only the blood-vessels have

degenerated. There is complete analogy with the skin disease described by Unna as "Sailor's skin," which, like this affection, is entirely dependent on the action of sun-rays.

Unna's teleologic conception of the entire process is noteworthy. "The excess of blood at the surface of the skin in the form of capillary hyperæmia and dilated veins, the hyperkeratosis, and the sclerosing of the epidermis, are all efforts on the part of the integument to counteract the deleterious action of the sun-rays." Of course, the epithelium may be changed during this procedure into dangerous, migratory pigment-epithelium.

Neisser agrees with Kaposi that xeroderma is an atrophy, but considers sunlight an ætiologic factor, in view of the marked predilection of the disease for uncovered parts of the body. The internal organs are always normal; oligocythæmia and leucocytosis are to be looked upon as secondary changes. Carcinoma, sarcoma, endothelioma, and mixed tumors may develop; starting from warts, fissures, or ulcers. Death takes place as a result of cachexia or in consequence of metastasis. Neisser calls the disease "Lioderma with melanosis and telangiectasis."

Lukasiewitsch, who found "full-grown" carcinoma in his very thoroughly examined cases, compares the affection to ichthyosis and prurigo, but considers Kaposi's designation of xeroderma as a happy one. Geber calls the disease Nævus pigmentosus; Taylor, Angioma pigmentosum et atrophicum; Pick, Melanosis lenticularis progressiva; Auspitz, Lioderma essentialis; Croker, Atrophoderma pigmentosum; Vidal, Dermatose de Kaposi.

It would be out of place to criticise the views of the various authors on the strength of four cases, those detailed above. A few points should, however, be accentuated. First, the family history, one of particular interest in my cases. Three brothers X. marry three sisters Y

Among the children of two of these couples five cases of xeroderma are found; not a single one among the offspring of the third union. As another Mr. X. married outside of the Y. family, and three Y. sisters married men who were not related to the X.'s without xeroderma appearing among their children, we cannot decide whether the germ of the disease is in the X. family or in the Y's. It also appears that there must be some factor besides that of sexual union of an X. and a Y. to determine the development of xeroderma in the offspring. The history of the first two cases speaks, to my mind, very strongly in favor of the sunlight theory, however fanciful this may appear at first sight; provided always that the data were not suggested to the mother in the course of repeated questionings. The more virulent course of the disease in the elder daughter might be explained by the presence of numerous congenital nævi in this case. Besides, it has been noted that congenital disease is always more marked in the first-born.

In the two pairs of cases there were certain striking differences—for instance, in the first, hyperkeratosis and wart-formation was a marked feature. The most intense formation of pigment, on the other hand, was noted in the second pair, particularly in the case of the younger sister. Even here, however, the color could hardly be called black, as it appears to have been in Greeff's cases.

The histologically most important question, and one which, as we have seen, has been answered in the most varied ways, as to the nature of the tumors and ulcerations, can hardly be discussed here. The supporters of the carcinoma theory do not seem to have been sure of their ground, to judge by the unusual characteristics which they have ascribed to the new-growths by such terms as "real" and "fully-developed," without indicating how "unreal" or "undeveloped" carcinoma would look, in the same place.

The ulcerations in our first case were certainly not

"real" and "fully-developed" carcinomata, as they invariably healed of their own accord, and so far have always remained, some of them for as much as six years, under the epithelial covering. Their significance must remain undecided. Such formations have, as yet, not been described sufficiently often in literature.

In regard to the most interesting manifestations of our four cases, namely, the ocular complications, it may be said that they substantiate, in a general way, the frequently reported observations which Greeff and Groenouw have collated. Partial loss of the cilia, tumor-formations of the most varied nature in the skin of the lids, atrophic shrinking of these structures with consecutive anomalies of position, corneal opacities and ulcerations, etc., are the most noticeable. Special attention must, however, be paid to the conjunctival shrinking, which was an invariable accompaniment of all four of my cases, and was caused, without a doubt, by a localized process of xeroderma. So extensive a cicatricial degeneration of the conjunctiva of both eyes as that seen in my first case rarely occurs. There is no doubt of the final outcome of the process in a xerosis of both eyes. The peculiar cicatricial formation in the region between the caruncle and the inner corneal margin, observed in all four cases, has not been described hitherto. The remarkable uniformity of localization forces us to the conclusion that the conjunctival and subconjunctival tissues in this region of some patients has been affected in its power of resistance to the morbid process of xeroderma. On account of its early appearance, this symptom may be of some importance in differential diagnosis. Similarly unique in its clinical, and above all in its histologic import, was the epibulbar tumor extirpated in Case 2. Most growths hitherto observed in xeroderma and affecting the conjunctiva have originated in the lids, as Pick's case and Case 1 of Lukasiewitsch, which latter does not appear to have been examined microscopically. So far, only

two cases of epibulbar tumor accompanying xeroderma have been reported. One is the second case of Lukasiewitsch, who observed a "papilloma" at the corneal margin which, after removal, showed repeated "epithelial relapses." Greeff's conclusion from this very cautious statement, that the tumor was a carcinoma, appears rather bold. The second observation is that of a boy of six, treated by Greeff himself, who had an undoubted epibulbar cancer.

The tumor in my case would then be a third. Some of the bits of tissue were, on extirpation, immediately placed in alcohol for gradual hardening, others were first fixed in Flemming's solution or in Zenker's fluid. My description of the histologic findings closely follows the drawings which have been made carefully after nature, avoiding all schematization. Considering the looseness with which tumors in general, and those accompanying xeroderma in particular, have been classified, it would seem evident that the fixation of such rarities in illustrations must be of greater importance than any designation. In order to keep down the number of illustrations, three sections, colored by various staining methods have been united in Fig. 1.

The surface epithelium of the conjunctiva has been drawn from a specimen treated with Meyer's fluid. The cells have been rather intensely stained, without showing any karyokinetic figures. In one or two places the chromatin is more prominent, while nothing is to be seen of the cytoplasm. The nuclei, stained dark blue, and generally lying in groups, belong to leucocytes. Some of them (*a*) are connected by fine strands. The large structures of varying form are beaker-cells, some with visible openings. These have not stained uniformly, probably on account of the varying content of mucin, which always presents itself as a dense snarl of threads. In some places they lie together like glands (*b*). At (*c*) the mucin has appeared at the surface. Nuclei cannot

be made out clearly within the beaker-cells. They do not seem to stain as well, by the way, with thionin as with chlor-alum hæmatoxylin. The curious structures lying in the middle of the epithelium in Fig. 2 were found repeatedly and are probably undeveloped beaker-cells. The subconjunctival tissue has been drawn for the greater part from a section which had been treated, after Unna, with polychrome methyl-blue, followed by alum-xylol, so that the structure is entirely obscured, while the protoplasm, in its various forms, is very beautifully marked. The endothelium of the vessels, reproduced, as are those cells which have been stained a faint blue, with black pencil, appears a little swollen. Mast-cells appear in large numbers, in the most varied form and size, with violet-red protoplasm and intensely blue nuclei. Other cells of the same form, but with dark blue protoplasm, are found in large numbers, and are to be considered as mast-cells. The chaotic cell-complex at (*d*) was drawn from a simple hæmatoxylin specimen. Such formations are found in the subconjunctival tissue in large numbers, both superficially and in the depths. The cells are connective-tissue bodies in migration and mitosis. The blood-vessels contained more white blood cells than happen to be shown in the drawing. Large mononuclear cells of another variety were also found in the intima of the blood-vessels, but their nature was not clear (derivates of endothelia, or embolic tumor-cells?). There were no prolongations of the epithelial layer into the depths of the tissues, even in the vicinity of the cornea, where only the physiological papillæ were to be seen. Here and there, however, formations could be seen which were most easily explained as sections of Stida's canals. They were never to be found in the neighborhood of the tumors themselves. The coarse structure of the latter could be best seen in sections treated with Van Gieson's hæmatoxylin, and examined under a low power. The tumor appears to be bounded by a thick capsule, in which a large number of

red-stained fibres run. A few of these can be followed into the interior of the growth, dividing it into small fields, like alveoli. The central portions of these alveoli have stained faintly or not at all; the peripheral portions are deeply colored. With a high power the unstained portion is seen to consist of structureless masses, in the interior of which large vacuoles have been produced by the process of shrinkage caused by the hardening fluids. Only a few leucocytes and some debris of cell-nuclei have taken up the stain. The staining of the nuclei becomes more and more distinct as we approach the edge of the alveoli, while the cytoplasm is nowhere so clearly differentiated as to allow any conclusions as to the form of the cell-body as a whole. Similar conditions are found in sections stained with hæmatoxylin-eosin, alum-carmine, and picro-lithium-carmine. The only method by which the protoplasm could be even partially brought out was Unna's, staining with polychrome methylene-blue, etc. Fig. 6 shows a specimen prepared in this way, and represents an alveolus directly under the common capsule which is only slightly degenerated. The nuclei, however, show, without exception, the signs of chromolysis, which, on other sections appears much further advanced. Of chromosomes nothing is to be seen. The chromatin is coagulated or disintegrated. In some places it has not been stained at all. The illustration shows no karyokinetic figures at all. They are at best extremely scarce, and very indistinct, in the deeper parts of the tumor near the sclera. The cytoplasm appears as a crumbly mass of dark color in the diffuse blue of the ground-stain. It is at once seen that the cells are very polymorphous, with bodies disproportionately large or small as compared to the nuclei. Between the fully visible cell-bodies we see some which are rudimentary, as at (*b*), or not fully included in the section. The other interspaces are probably artefacts. Toward the right the cells become smaller, and a few spindle-shaped elements appear, so that the

specimen seems more deeply stained when examined under a low power. This spot shows a faintly indicated alveolar wall toward the larger cells on the right, which belong to a neighboring alveolus. Toward the depths there is a sharp boundary line toward the stroma-tissue. Connective-tissue cells, leucocytes, and occasional mast-cells are seen. The stroma of the capsule, of which only the inner part has been shown on the drawing, consists of connective tissue which has turned into cells. The fibrils have disappeared and the cell-bodies have become very rich in protoplasm. Some of them appear to have become migratory. The outer layers of the capsule are, of course, fibrillary; at least there is a marked difference between the cells of the stroma and those of the parenchyma of the tumor. The reason of the protoplasm being represented with much difficulty lay in the marked degenerative changes which it had undergone. Fig. 3 shows a drawing from a section fixed in Flemming's solution, and colored with safranin, and represents the margin of an alveolus under high power. The parts which are more or less closely dotted in lead-pencil must be considered as deposits of metallic osmium, and prove the presence of an extensive fatty degeneration within the parenchyma and stroma of the tumor. Closer inspection shows that only one point (*a*) of the picture has remained intact; elsewhere the protoplasm is more or less completely degenerated, and even the nuclei and nucleoli have been affected. Here and there, osmium is found irregularly scattered in the tissues. The nuclei at these points are either entirely destroyed, or they do not appear on the section. On the other hand, the free-lying red figures represent either the last remnants of coagulated nuclear substance, or they are nuclei of leucocytes.

The above mentioned coagulated masses inside the alveoli have, for the most part, caused no precipitate of osmium, so that we may conclude that there has been here either a further splitting up or a complete absorption

of the fat. The reactions for amyloid, mucin, glycogen, colloid, and so on, were all negative.

Within the alveoli, at times near the middle, or, again, at the margin, we find other interesting structures which must be interpreted as parenchymatous giant-cells (Fig. 6 *a*, Figs. 4 and 5). The large protoplasma bodies contain 15 nuclei and more, of the most varied size and quality. Here, fatty degeneration has been active, as can be clearly seen, even in the interior of cells.

What, finally, is the histological and clinical significance of this tumor? First of all, it is evident that it is not an epithelial proliferation of conjunctival origin, for, aside from what has been said about the conjunctiva, above, the capsule of the tumor was absolutely unbroken. The structure, furthermore, spoke strongly against an origin from Tenon's capsule or scleral tissue, in the form of an endothelioma. It is most probable that a nævus, or some other aberrant rudiment was the starting-point of the tumor. It is known that similar processes are frequently found in the conjunctiva. Greeff even found pigment-spots and telangiectasies in the conjunctivæ of his xeroderma patients. The fact that in all four patients of the X. family there was a cicatricial degeneration of the inner portion of the conjunctivæ, together with the microscopic picture, are proof positive that in xeroderma abnormal "developmental and vegetational anomalies" take place, not only in the papillary layer of the cutis, as Kaposi claims, but in that of the conjunctivæ as well.

While the detailed statements of the author, given above, apply undoubtedly to the skin, in the sense that these processes stimulate the epithelium and endothelium of any nævi which may be present to precocious growth, and so to tumor-formation, the possibility of such a process taking place in the conjunctiva must also be admitted. The question as to whether we have to deal with a carcinoma or a sarcoma is not satisfactorily answered.

V. Hansemann says: "We must admit that the words

carcinoma and sarcoma have ceased to convey any meaning to the physician of to-day," and everyone knows that tumors originating in nævi are called carcinoma by some pathologists and sarcoma by others. The distinction which is usually made between the two forms of tumor can not be carried out. The tumor under discussion could more justly be considered a carcinoma than a sarcoma, as there is a distinct contrast between the parenchyma and the stroma, and the cells are joined in epithelial groups. Considering the absence of cancerous strands and of tubular structures, the term of medullary carcinoma appears most appropriate. We cannot predict whether the unfortunate child will remain free from a recurrence at the site of operation. At all events, the marked tendency of the tumor-tissue to undergo fatty degeneration at all points, and the scarcity of mitosis, seem to speak in favor of the eye remaining unaffected by further tumor formation.

ABSTRACT OF ARTICLES IN VOLUME XLV., GERMAN EDITION, 1902, NOT PREVIOUSLY TRANSLATED.

By Dr. ALFRED BRAUN, New York.

(With diagrams in the text.)

I

A CLINICAL CONTRIBUTION TO THE STUDY OF THE STRUCTURE OF THE IRIS.

By Dr. E. WÖLFFLIN, Munich.

The author describes a condition which he has noticed in many irides, which is not pathological, and which has not heretofore been described.

The pupillary and ciliary zones of the iris are separated by the circulus iridis minor. From this circle, numerous trabeculæ pass to the pupillary border, as well as to the ciliary margin of the iris.

In blue irides, these ridges are usually more marked than in brown irides.

Those trabeculæ, which pass toward the pupillary margin, usually end without showing any enlargement, while those which pass to the ciliary border, show in many cases, at their termination, a marked thickening, which may be called a normal iris nodule.

These nodules are always white in color. They lie close to the ciliary border of the iris, and are often partly hidden by the overhanging edge of the sclera. They are usually most marked in the lower-outer and lower-inner quadrants of the iris.

In a few cases, they may be seen in the region of the circulus iridis minor, but they are usually much smaller here, and are partly hidden among the trabeculæ. In the ciliary portions of the iris, they reach the size of a pin-head.

The nodules were present in 10% of all cases examined. They are much more common in blue than in brown irides. There are usually 10 to 20 nodules present. When examined with the corneal microscope, the nodules are seen to consist of a mass of fine white convoluted threads. They are triangular in shape, with the base outward.

The nodules are not inflammatory, since there is no circumcorneal injection, and they are always bilateral. They are not new-growths, since they never change in appearance.

Whether they sometimes form the starting-point of syphilitic or tuberculous papules, is uncertain.

It is possible, as Prof. Eversbusch suggests, that the nodules may result from obliterated blood-vessels.

It is possible that they may be the remains of the pupillary membrane.

II

A CONGENITAL ANOMALY OF THE CORNEA AND SCLERA, AS WELL AS OTHER MALFORMATIONS, IN TWO HORSES' EYES.

By Dr. O. SALFFNER, Wuerzburg.

The two eyes of a newborn horse are 39.1 by 38.5 by 31*mm* in size. On that portion of the cornea and sclera which corresponds to the palpebral fissure, 3.3*cm* long by 0.95*cm* broad at the temporal end, and 0.6*cm* broad at the nasal end, is a patch, darkly pigmented, like the animal's skin. It is slightly elevated, and covered by grayish points. It is surrounded by a pigmented groove.

Below the optic-nerve entrance, the sclera forms a large ectatic pouch.

The left eye was cut sagittally, through the middle of the cornea and the nasal border of the optic-nerve entrance.

The lower border of the pigmented area lies opposite the middle of the pupil.

Corresponding to the optic entrance, is a depression 3*mm*

deep and 5–6*mm* wide. The pigment epithelium reaches the sharp edge of this ectasia above and at the sides. The lower border of the ectasia is continuous with a large excavation, which reaches forward almost to the ciliary body. It is 17*mm* wide at its broadest point. In a few places, this ectasia shows a little pigment. From the temporal border of the optic-nerve excavation, there runs through the entire coloboma, up to the ciliary body, an elevated ridge about 1*mm* high, containing thickened nodules at two places.

From the nasal border, a smaller and lower ridge runs parallel to the first. Near the ciliary body there is a small transverse ridge.

On the upper-inner quadrant of the posterior surface of the lens, there is a white thickening, from which a number of fine white threads go to the upper vena vorticosa.

The lens is displaced downward about 1.5*mm*.

The anterior chamber is absent. Microscopical examination shows the following:

Of corneal tissue, only the ground substance is present. On the anterior surface of this is a layer of dense connective tissue, covered by stratified squamous epithelium. The deeper parts of the epithelium contain much pigment. In the connective-tissue layer are many alveolar glands. The ducts are lined by stratified squamous epithelium, while the alveoli are lined by polygonal cells with large nuclei. Between the glands are many blood-vessels and clumps of pigment. At the groove surrounding the cornea, the squamous epithelium is continuous with the conjunctival epithelium.

The sclera is thinned in various places, especially below the optic disk. Of the two ridges, the medial consists of normal scleral tissue, while the temporal contains, in the two thickened nodules, masses of hyaline cartilage.

There is no choroid in the region of the coloboma. The ciliary body is small. The iris lies close against the posterior surface of the cornea. In the upper part, only the pars iridica retinæ is present, which is adherent to the cornea. The pupil is filled in by fibrous tissue, which is separated from the cornea by a narrow space lined by endothelium.

The cortex of the lens consists of swollen masses of fibres with many vacuoles. Central to this is a narrow zone of

normal fibres, followed by a layer where the fibres are changed to fine droplets and detritus.

At the posterior pole there is a layer of cuboidal epithelial cells. At the anterior pole there are some epithelial cells, continued into fibres, which go directly back toward the posterior pole.

On the posterior surface of the lens lie masses of connective tissue, which in two places enclose degenerated lens fibres. Above this is a mass of retinal tissue. This is continuous with the pars ciliaris retinæ. From here to the equator there are remains of retinal epithelium. At the equator the normal retina begins.

In the lower part of the ball the retina is normal, but in the coloboma there is only a rudiment of retinal tissue overlying the sclera.

No central vessels are seen in the nerve. There are many small vessels which pass from the nerve into the floor of the ectasia.

The changes in the right eye are similar to those in the left, except that there is no coloboma of the choroid, and the lens is not displaced downward. The cortex of the lens shows more degeneration than in the left eye.

The pigmented tissue on the cornea and sclera resembles normal skin. It is more thickly studded with sebaceous glands and contains no hair. We might consider this a sort of dermoid, although there is no distinct tumor present.

Dermoids of the cornea are supposed to be due to adhesions between the amnion and the ball. Another explanation is that the third lid, or nictitating membrane, is pressed against the ball by the lids, and adhesions result. In these eyes, however, the third lid was present, and was perfectly normal, and in no way connected with the pigmented strip of cornea. It contained no glands of any kind.

We might consider that the amnion, lying in contact with the surface of the ball for some time, becomes adherent to it. The iris, at first, lies close to the cornea. The pressure of the amnion on the cornea might prevent the formation of the anterior chamber. This might result in the faulty development of the iris and ciliary body, and in the failure of the pupillary membrane to disappear.

In the right eye there is a coloboma of the optic nerve. In the left eye there is, in addition, a coloboma of the choroid. There are no central retinal vessels, which is typical of coloboma of the nerve.

There are many theories with regard to the origin of colobomata.

Deutschmann's theory is that they are due to intra-uterine inflammations.

Kundrat's theory is that they are due to trophic influences from the brain.

Pichler's theory is that they are due to the action of toxines.

The theories of Manz, Hess, Bach, etc., are that the colobomata are due to the persistence of atypical connective-tissue strands and mesodermal vessels, which cause delay in the closure of the optic cleft. These strands show a tendency to the formation of cartilage, as in the present case.

In both balls there are remains of the vascular lens capsule. The faulty development of the ciliary body, whose function is to nourish the lens, might have caused a delay in the disappearance of the vascular lens capsule, until too late to become entirely absorbed. This would also explain the degenerative changes in the lens.

III.

A CASE OF PULSATING CHOROIDAL VEIN.

By Dr. W. THORNER, Berlin.

Pulsating retinal veins are fairly common.

Pulsating retinal arteries are not so common, and are seen in cases of increase of intraocular pressure, or disturbances in the general vascular system.

Pulsation of the choroidal vessels has never been described before.

The patient in whom this phenomenon was seen is 20 years of age. His left eye is normal. In the right eye there is poor vision. There is a slight divergent squint. The right eye does not fix. The sight in the right eye is $\frac{1}{100}$. There is a myopia of —14 D, a large posterior staphyloma, with numerous choroidal changes.

The fundus is pale, especially about the disk, and the choroidal vessels are plainly visible. One of the choroidal veins passes obliquely across the temporal portion of the staphyloma, from above, downward and inward. This vein shows a distinct pulsation with each beat of the heart, apparently synchronous with the radial pulse. In no other vessel is there a sign of pulsation. Slight pressure on the eyeball produces a pulsation in the retinal veins, and at the same time a diminution in the pulsation of the choroidal vein. Stronger pressure causes a more marked pulsation in the retinal veins and at the same time causes the choroidal vein to become entirely emptied of blood.

The choroidal vessel shows a decided parallactic displacement, proving that it is positively in the choroid. It has no connection with the optic disk. The author is not positive about the direction of the blood-current in the vessel.

This phenomenon is probably due to some local cause probably in connection with the formation of the staphyloma and with the circulatory changes which take place in the vessels within the staphyloma.

IV.

A PECULIAR COMBINATION OF ABDUCENS PARESIS AND HEMIANOPSIA, WITH A CONTRIBUTION TO THE THEORY OF THE DISTURBANCE OF VISUAL MEASUREMENT SEEN IN PATIENTS WITH HEMIANOPSIA.

By Dr. LOESER, Berlin.

A combination of hemianopsia with paralysis of an extern eye muscle on the same side is rare, since the former has lesion on the opposite side of the brain, and the latter, on t same side.

A case of this sort appeared in Prof. Oppenheim's clin in 1901. The patient, a woman of 43, complained of seve frontal and temporal headache. This was followed by verti and frequent vomiting. After 5 weeks, a convergent str bismus appeared.

Objective examination showed the following:

1.—The left eye converges about 30°, and moves only 2–3*mm* from the median line towards the left. All other movements of the eye are free.

2.—The left pupil is slightly larger than the right, but reacts well to light and accommodation.

3.—There is a beginning optic neuritis in both eyes.

4.—There is a typical bilateral left homonymous hemianopsia. There was no hemiopic pupillary reaction.

The diagnosis was made of a new-growth, probably specific, at the base of the brain, involving the right optic tract.

The patient did not complain of diplopia, except when the light came from a certain direction. When examined in the ordinary way, no diplopia could be elicited, although central vision was good in both eyes. Even von Graefe's prism test could not elicit diplopia.

The explanation of this fact is as follows: The right half of each retina was blind. When the light was held in front of the eyes, it was fixed with the macula of the right eye. Since the left eye turned in, the image fell to the right of the macula of the left eye—that is, on the blind portion of the retina, and therefore there was no diplopia.

When the right was suddenly covered, the light could not be seen at all, at first. After a while, however, by extra exertion, the left eye was made to fix the light. If, now, the right eye were uncovered, diplopia occurs, on account of the secondary deviation of the right eye causing the image to fall to the left of the macula of the right eye, *i.e.*, on the normally functionating portion of the retina.

When the eyes were turned to the left, in the province of the paretic muscle, there was no diplopia, since the image falls on the right half of the retina of the left eye. When the eyes were turned to the extreme right, there was diplopia, because the image falls on the left half of the retina of the left eye.

Liepmann and Kalmus have described a disturbance of visual measurement in patients with hemianopsia, which is shown as follows: if asked to divide a horizontal line in half, they will invariably make the portion on the blind side too small. The author has confirmed this in many cases.

The explanation given by Liepmann is as follows: there is a distinct relation between the centripetal stimulation and the

cortical sensation of motion; the loss of the centripetal stimulations from the blind halves of the eyes causes a disturbance of this relation, in such a manner that the movement no longer takes place under the most favorable conditions for shortest distance and least expenditure of energy. Consequently a patient with left hemianopsia, in the attempt to divide a line, will easily cover the right half of the line, while, in covering the left half, through the loss of the regulating centripetal stimulations, a greater effort is required, and consequently this half is overestimated, and made too short.

The present case will help to clear up this question.

In one eye, there is only a visual defect. In the other eye there is a visual defect and a muscular paralysis. If the muscular and allied senses were responsible for the error in visual measurement, there would be a difference in the error made by the two eyes.

Several hundred trials were made with each eye separately, and it was found that the error made by both eyes was exactly the same.

Consequently the muscular paralysis cannot be the cause of the error. There is much less probability that the cause is the more subtle disturbance of motility caused by the loss of correlation between the centripetal impulses, and the sensation of movement, as supposed by Liepmann.

Feilchenfeld thinks that the form of the visual field might have an important bearing in the causation of this error.

V.

CYST FORMATION IN THE LENS.

By Dr. OTTO BROXNER, Munich.

M. F., a domestic, 32 years of age, came to the Munich Eye Clinic on Dec. 13, 1901, complaining of poor sight, since childhood. She had had many attacks of inflammation of the eyes. At the age of 6 years she was struck in the right eye with a whip, and was taken care of at that time by Dr. von Rothmund. She had at that time a traumatic cataract which was removed by linear extraction, after repeated ineffectual discissions, on Sept. 27, 1875.

When seen by me, her condition was as follows:

O.D. Sees motions of the hand at 40–50 *cm.* Light projection is good. With —10.0 D, she reads No. 15, Schweigger's type, at 20*cm.*

O.S. With +1.5 D = $\frac{5}{10}$. Nieden's type No. 1, at 10–25*cm.* In the nasal portion of the cornea, is a triangular opacity. Irregular astigmatism.

On looking straight ahead, the right eye deviates slightly upward, so that the lower border of the right cornea is about 2*mm* higher than the left.

The right cornea is oval, with the greatest diameter horizontal. It is irregularly curved. There is a linear scar, parallel to the limbus, in the lower-outer portion. Internal and parallel to this is a smaller finer linear cicatrix, and internal to this is a faint circular opacity, which partly covers the pupil.

The anterior chamber is deep, especially in the upper temporal portion, where there is a posterior synechia, and the iris is drawn backward. In the nasal upper portion, the iris is pushed forward, and almost touches the posterior surface of the cornea.

The pigmented border of the iris is wanting in places. There is tremulousness of the iris in its lower temporal portion.

Under homatropin, the pupil is egg-shaped. The remains of the lens capsule are plainly seen.

A band of thickened capsule passes horizontally across the upper third of the pupil. Above this band a cyst is seen, which causes a bulging forward of the upper part of the iris. The lower portion of its anterior surface is covered by a sickle-shaped pigmented mass. The upper part is fairly transparent, except for a few thin pigment stripes. The cyst contains a clear fluid, and is covered by a whitish membrane behind. The cyst cavity is continued downward into a cleft between the anterior and posterior lens capsule, which passes down parallel to the nasal border of the pupil, in the form of a sausage, and disappears behind the lower pupillary border. The anterior surface of this cleft is covered by a band of thickened capsule. The posterior wall of the cleft also consists of thickened membrane in its nasal portion, whereas its central portion is thin and transparent. At the lower pupillary border is a narrow

tear in the capsule, through which the fundus can be plainly seen. There are no changes in the fundus.

How is this cyst to be interpreted? Against a cysticercus cyst, are the clear fluid and absence of formed contents.

From the pigmentation of the anterior wall, one might think of cyst of the ciliary body. But the pigmentation involves the portion of the cyst farthest from the ciliary body. Moreover, the posterior lens capsule can be seen to form the posterior wall of the cyst. There is also a communication between the cyst and the cleft between the layers of the lens capsule.

There is no connection between the cyst and the iris. Dilatation of the pupil causes no change in the shape or appearance of the cyst.

The pigmentation on the anterior surface of the cyst shows that the iris must have been adherent to it at some time.

We have undoubtedly to deal with a cyst of the lens capsule.

The extraction of the lens, in 1875, was undoubtedly followed by an iritis, with adhesions between iris and lens capsule. These adhesions caused the anterior lens capsule to be drawn forward and separated from the posterior capsule, allowing the aqueous to fill up the space between. The central portions of the two layers of capsule remained adherent to each other. Thus there was formed a cyst in the upper and nasal portion of the lens. Aqueous humor might enter the cyst through the cleft at the lower pupillary border, or it might be diffused through the capsule from the ciliary processes.

Later, the adhesions between iris and capsule were torn, leaving a portion of the capsule pigmented.

VI.

CONCERNING THE OCCURRENCE OF INFECTIOUS EXTERNAL EYE DISEASES IN THE WESTPHALIAN INDUSTRIAL DISTRICT.

By Dr. SCHMIDT, Prenzlau.

Since the recognition of the importance of bacteriological examinations, our conceptions of conjunctival diseases have undergone many changes.

In order to study the relations of the infectious forms of conjunctivitis to conjunctivitis in general, all of the cases of primary conjunctivitis which came to the clinic in the two years from September 1899 to 1901, were carefully studied. As primary conjunctivitis, all those cases were included which were not due to a direct traumatism, or secondary to any other eye disease or general disease.

The presence of conjunctival secretion was taken as a criterion of the infectiousness of a conjunctivitis, although it is well-known that there is no positive criterion.

Of 6000 patients treated in these two years, 1560 had primary conjunctivitis. Of these, 784 were simple dry catarrh, or simple catarrhal conjunctivitis, or follicular conjunctivitis, 248 were granular conjunctivitis, and the remaining 528 embraced the other infectious conjunctivitides.

In 295 cases bacteriological findings were positive. The organisms found were the diplobacillus of Morax-Axenfeld, the pneumococcus, the gonococcus, the diphtheria bacillus, and the Koch-Weeks bacillus.

The only one of these organisms which gives rise to a typical form of conjunctivitis is the diplobacillus of Morax-Axenfeld. All the other organisms may give rise to different types of conjunctivitis.

The pneumococcus may give rise to a simple conjunctival catarrh, or a severe croupous conjunctivitis. Some cases of pneumococcus conjunctivitis would be difficult to differentiate from a Koch-Weeks conjunctivitis.

The most common form of infectious conjunctivitis was that due to the diplobacillus. Of these, there were 193 cases. There were 132 in the male and 61 in the female. It was most common in young adults, in the spring and summer time. It is found in all grades of severity, from mild catarrh with a slight angular blepharitis, to the most severe type, with general blepharitis, swelling and redness of the lids, and profuse muco-purulent secretion. The average case, however, is mild, and yields readily to treatment with zinc sulphate, ½ to 1%.

The diplobacillus is usually demonstrated very readily in the flakes of mucus at the outer angle of the eye. Sometimes they are obtained in pure culture, and sometimes with staphy-

lococci, xerosis bacilli, or pneumococci. In 7 cases there were corneal complications.

For the recognition of the diplobacillus, a cover-glass preparation is usually sufficient. The bacilli are seen in large numbers. They are usually in pairs, and sometimes in short chains. Their length and breadth are variable. The cultures on ascites or hydrocele-agar fluid look very much like colonies of pneumococci. They form delicate gray, partly transparent, slightly raised colonies, about 1*mm* in diameter.

The cases of pneumococcus conjunctivitis were very varied. They occurred mostly in young people. The onset was usually sudden. The cases were mostly severe. There was usually profuse muco-purulent or purulent secretion, or false membrane. Chemosis, episcleral injection, and subconjunctival hemorrhages were common. It is often unilateral. The prognosis is usually good. Protargol 3–5% is usually efficacious.

There were 90 cases of pneumococcus conjunctivitis, 53 in the male and 37 in the female. It is most common in the spring.

Several clinical types were seen.

1.—Simple chronic or subacute catarrhal conjunctivitis, with slight reddening of the palpebral conjunctiva, slight secretion, and very mild subjective symptoms. There were 20 such cases.

2.—Acute inflammation, with œdema of the lids, much reddening and swelling of the palpebral conjunctiva, and swelling of the palpebral conjunctiva and fornices; episcleral injection, small hemorrhages, and sometimes chemosis, and profuse muco-purulent or purulent secretion. There were 56 such cases, of which 13 were unilateral. In 4 cases the cornea was involved.

3.—Pseudomembranous conjunctivitis occurred in 7 cases. In two cases the cornea was involved. In one case, streptococci were present in addition to the penumococci. There were many transitional forms between these three types of cases.

Pneumococci were demonstrated by cover-glass preparations in 73 cases, in 13 cases by hydrocele-agar, or bouillon-agar cultures, and in 4 cases by both methods. There were

many variations in the appearance and arrangement of the pneumococci. There were small types which resembled gonococci, and long lance-shaped types, with and without a capsule, in pairs or in chains. The colonies, although in other characteristics typical, showed variations in color, from almost complete transparency to a milky-gray color.

A typical blennorrhœa neonatorum occurred in 10 cases. The gonococci were demonstrated in cover-glass preparations. Cultures in hydrocele fluid were unsuccessful. Involvement of the cornea was present in one case.

It is very difficult to differentiate between the true diphtheria bacillus, and the pseudo-diphtheria bacillus. No case was observed with the typical clinical appearance of diphtheritic conjunctivitis. One case was observed in a girl 1½ years of age, which showed the characteristic Ernst-Neisser polar body staining.

There were two cases of Koch-Weeks conjunctivitis.

233 cases were seen which had the appearance of infectious conjunctivitis, but in which no pathogenic bacteria could be demonstrated. They showed the same clinical appearances as those in which pathogenic bacteria were found.

Several cases were seen which had the appearance of an acute trachoma, but disappeared in a short time.

42 cases of primary ulcerations of the cornea were observed. Of these, 30 were examined bacteriologically. Pneumococci were found in 18, pneumococci and diplococci in 2, diplobacilli in 6, and bacillus pyocyaneus in 1. In 5 cases no bacteria were found.

All of the pneumococcus cases showed a typical picture of ulcus serpens, in most cases with hypopyon. The diplobacillus cases were milder than the pneumococcus cases.

The case in which bacillus pyocyaneus was found was very severe.

VII.

LID FORMATION AND TRANSPLANTATION IN OPHTHALMIC PRACTICE.

By Dr. MAX MEYERHOF, Bromberg.

Plastic operations are performed upon the conjunctiva and

lids to preserve the mobility of the eye, as well as to correct facial disfigurements. These operations may be done in one of two ways: Either a pedunculated flap is drawn over from the neighboring skin or mucous membrane, or a separate piece of tissue is transplanted from the same or another individual, or even from an animal.

Many methods have been described. Of the non-pedunculated methods, Wolfe–de Wecker's transplantation of guinea-pig's mucous membrane for symblepharon and Wolfe's skin transplantation for ectropion were much in favor 20 or 30 years ago, but their good results were not lasting. Since then, most operators prefer to use pedunculated skin-flaps, in the formation of lids.

The following cases were operated on in the Bromberg Eye Clinic by Dr. Augstein in 1899.

I.—BLEPHAROPLASTIC OPERATIONS.

1. W. B., aged 62, was taken into the clinic on August 7, 1899, with an epithelioma involving the entire left lower lid. After operation, the defect was covered in by a Wolfe's skin graft from the arm. In spite of the best care, the entire graft became gangrenous. On September 11th, the wound was freshened up, and covered in by a pedunculated skin-flap from the temple. The secondary defect on the temple was sutured. A conjunctival sac could not be made. Healing was smooth, with a good cosmetic result.

2.—V. S., 66 years of age, was brought to the clinic on Nov. 14, 1899, with an epithelioma of the left lower lid. The entire lower lid had to be removed. A pedunculated flap, 1½ times the size of the defect, was cut from the temple, rotated 90° and sutured into the defect. The conjunctiva, which was cut off at the lower fornix, was loosened from the underlying sclera, and sutured to the upper edge of the new lid. This formed a shallow conjunctival sac. The secondary defect was sutured; 14 days later, the pedicle was cut through. Healing was uninterrupted. Four weeks later, there was a slight erosion of the cornea. This was due to irritation from lanugo hairs, which were removed by the galvanolytic needle.

3. E. S., 54 years of age, has an epithelioma involving the

ower lid, the inner angle of the eye, with the caruncle and ear-sac, and the inner third of the upper lid.

The extirpation of all diseased tissue was performed with difficulty. A large frontal skin flap was made, rotated 100°, and laid over the defect in the lower lid. It was then split, so that the larger lower portion covered the lower lid, and the smaller upper portion covered the nasal half of the upper lid. Between the two portions lies the new inner angle of the eye. The secondary defect was sutured. A large piece of conjunctiva was sutured into the inner angle, which was obtained from a child with spastic ectropion, with hypertrophied conjunctiva. Healing was uninterrupted. A few lanugo hairs had to be removed later.

The disadvantages of the pedunculated flap methods are the disfigurement of the scar of the secondary defect, and the fact that the disfigurement is very great if the flap becomes gangrenous.

Ollier, Le Fort, and Wolfe transplanted a large thick skin-graft from the arm. But there is always marked secondary contraction in these cases, and gangrene is common.

Thiersch's grafts cannot be used when the entire lid is gone.

The non-pedunculated method should only be used where the pedunculated method is impossible, as when the defect is surrounded by scar tissue, which cannot be used as a flap.

The Italian method consists in applying a pedunculated flap from the arm to the lid, and holding the arm in place by means of a plaster bandage, until the flap has healed in. The results have not been good with this method.

Dieffenbach's method of flap transplantation is used considerably. De Vincentiis has described many modifications of the pedunculated flap method. Landolt sews the edge of the defect to the freshened edge of the good lid, and after healing has taken place, splits the lid into two parts.

Many methods have been used to form a new conjunctival sac. Eversbusch separates the flap from the underlying tissue and covers its under surface with a skin graft, and after this has healed in, applies the flap to the defect.

De Vincentiis uses lip or vaginal mucous membrane in the same way. Uhthoff covers the flap with a skin graft after it

is sewed into place in the defect. The lanugo hairs of the skin often irritate the cornea, and must be removed.

II.—SYMBLEPHARON AND ANKYLOBLEPHARON.

M. H., 60 years of age, was admitted to the clinic on Sept. 30, 1899. He had a very marked trachoma, and in the right eye the upper lid was entirely adherent to the ball, and the lower lid, at its inner part. The eye is almost immobile. The palpebral fissure was enlarged at both ends, and the bands of adhesion separated, and, four hours later, the raw areas covered by mucous membrane taken from the mouth. The flap was fastened by sutures passed through the fornix, and tied at the orbital margin over a roll of gauze. At the edge of the lid a few sutures were also placed. Healing was uneventful. But after a week contraction began, and after four weeks the condition was the same as before operation. The cicatrices were again divided, and covered by a large piece of vaginal mucous membrane, obtained from a patient upon whom a colporrhaphy was done. This also contracted slightly, but a fairly free range of motion was retained.

Ordinary division of a symblepharon is never successful.

VIII.

ON THE THEORY OF THE DETERMINATION OF REFRACTION.

By Dr. W. THORNER, Berlin.

In a previous paper, the author described the method of determining refraction by means of his non-reflecting ophthalmoscope.

The most accurate determinations were made when the observer focussed sharply upon the retina. With a little practice, the error can be reduced to 0.25 D.

The author has constructed several tables, which are of value for other methods of refraction as well as the author's own method, for subjective as well as objective examination.

The determination of refraction depends upon finding the far point of the eye—that is, the point at which the image of the macula is formed by the dioptric apparatus of the eye.

The distance of this point is measured from the anterior nodal point of the eye taken as the o point. The determination of this distance gives the internal refraction of the eye.

This method, however, gives rise to many errors. A glass, for instance, of — 4. D, if placed before an eye whose internal refraction is — 4. D, would make an emmetropic eye of it only if the glass were placed in the anterior nodal point of the eye. A glass is usually placed, however, 1*cm* in front of the cornea, or 17*mm* in front of the nodal point. At this point the glass would have to be — 4.25 D, in order to correct the eye. A — 4.00 D glass would correct an eye whose internal refraction is — 3.75 D. The more marked the ametropia, the greater the errors.

If we call a point 1*cm* in front of the cornea the correction point of the eye, and use this point as the o point in our determination of refraction, we obtain the external refraction of the eye.

If the internal refraction of an eye is — 4.00 D, its far point is 250*mm* in front of the nodal point, or 233*mm* in front of the correction point. This gives an external refraction of — 4.25 D. If the external refraction is — 4.00 D, the far point lies 250*mm* in front of the correction point, or 267*mm* in front of the nodal point. This gives an internal refraction of — 3.75 D.

The subjective examination gives us the external refraction. The author has constructed a table which gives the relationship between the internal and external refraction from + 12 D. to — 22 D, at intervals of $\frac{1}{4}$ D. The table contains 4 columns; the first, containing the distance between the far point and the nodal point in *mm;* the second, containing the internal refraction; the third, containing the external refraction; and the fourth, the distance between the far-point and the correction point.

Between + 2.75 D and — 2.50 D, there is practically no difference between internal and external refraction. At — 7. D there is 1. D difference, and at — 10. D, 2. D difference.

In retinoscopy, we obtain the external refraction of the eye, when the correcting glass is held 1*cm* in front of the cornea.

In refracting by means of the ophthalmoscope, we do not bring the correcting glass nearer than 4*cm* in front of the cornea. This is 30*mm* from the correction point. With this

method, we come within $\frac{1}{2}$ D of the correct value, only in those ametropias in which the intervals between two values of the internal refraction, which differ by $\frac{1}{2}$ D, are not less than 30 *mm.* This is the case between — 4.5 D and + 4.5 D.

The author has attached an apparatus for determining refraction to his ophthalmoscope. The scale, which is attached to the draw-tube, passes under an index, and carries three divisions, marked by the letters M, E, and H, each of which is used with the corresponding ocular. This apparatus determines the internal refraction of the eye.

The following arrangement is used to place the front opening of the ophthalmoscope 1 *cm* in front of the cornea: The pupil is looked at through a prism which lies to one side. The edge of the light thrown from the lamp lies in the optical axis. The visual axis of the searcher lies oblique, consequently the two lines intersect each other at some point. If the middle of the searcher is marked by a perpendicular line, this will be seen to move from right to left across the pupil, as the eye is moved farther away, or nearer.

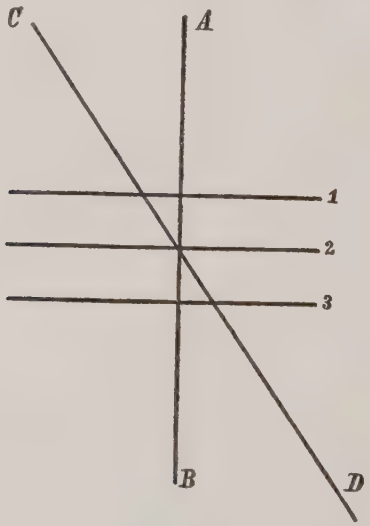


FIG. 1.

If A B (Fig. 1) indicates the optical axis of the ophthalmoscope, the line between the light and dark portions of the pupil lies in this axis. The line along which the iris is viewed,

is C D. If we consider the iris in the three positions, 1, 2, and 3; at 1, the line in the searcher lies to the left of the edge between light and dark, which shows that the eye is too far from the ophthalmoscope. At 3, it is to the right, consequently it is too near. At 2, they coincide, which shows the proper position.

A table is given, which shows the amount of displacement of the eye, in front of the instrument, necessary to cause an error of $\frac{1}{4}$ D, in different refractive conditions, from + 20 D to — 20 D. We see from this that the error can be disregarded in refractive conditions between + 8.00 and — 8.0 D. In cases above 8.0 D, in order to get accurate results, the eye must not be moved more than 1–2*mm*, which is easily regulated by means of the searcher. The apparatus consists of the following: A totally reflecting glass rod throws the light from the lamp on to an oblique mirror, which lies to the right of the scale, which it illuminates. The accommodation of the observer must be entirely relaxed. This is

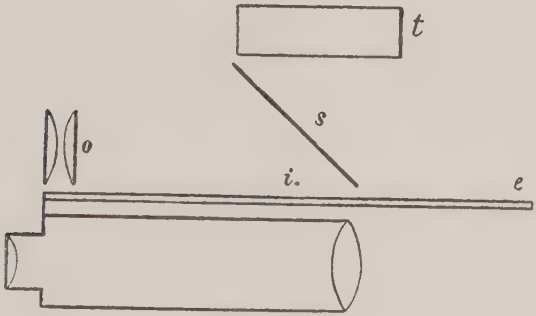


FIG. 2.

hindered if the observer must accommodate for each reading. To overcome this, the reading is done through a lens, in whose focal point the index lies.

In Fig. 2, *i* is the index, a line upon a glass plate, under which the scale *e* moves. The observer sees this through the lens *o*, with the help of the oblique mirror *s*. The index lies in the focal point of the lens *o*, so that the scale appears clear to an eye accommodated for ∞. The reading can be made by

another person, if the mirror is reversed. The scale then appears in the mirror *t*.

IX.

PATHOLOGICAL EXAMINATION OF A SYMPATHIZING EYE, WITH REMARKS ON THE ORIGIN OF SYMPATHETIC CHORIO-RETINITIS.

By Dr. S. OSAKI, Arigata, Japan.

The results of pathological examination of sympathizing eyes, up to the present, have been far from constant.

The most common conditions present were the following:

A fairly constant condition was a fibro-cellular inflammation of the uveal tract, a localized or diffuse round-cell infiltration, with occasional mast cells and giant cells. These infiltrations are more marked in the anterior than in the posterior parts of the ball. There is usually considerable pigment scattered throughout the uveal tract, showing that we have to deal with a subacute or chronic inflammation. These changes are usually followed by organization of the exudate, with atrophy, and finally phthisis bulbi.

The changes found in the individual portions of the eye are usually as follows:

The conjunctiva, cornea, and sclera usually show the changes due to the injury.

The anterior chamber is shallow from flattening of the cornea and protrusion forward of the iris. The spaces of Fontana are often closed. There is fibro-cellular exudate in the aqueous.

There are diffuse or nodular round-cell infiltrations in the iris. The changes are most marked in the vascular layer. The iris is usually thickened. Posterior synechiæ are common. The anterior surface of the iris is sometimes covered by exudate. Later on, the iris loses its characteristic structure, and we find only a mass of pigmented connective tissue.

The ciliary body usually shows marked inflammatory changes. Near the sclera, there are large masses of round cells, which extend around the ciliary vessels and nerves, and to the region of the canal of Schlemm and the spaces of Fontana.

The most marked changes are usually between pigment epithelium and ciliary muscle. The epithelial layer is often raised up by exudate. The ciliary body becomes filled with pigment, and the muscle becomes atrophied. Organization of the exudate results in separation of the ciliary body and adjacent portion of the choroid from the underlying sclera.

The inflammation in the choroid is most marked in the outer layers, more in the stroma than in the suprachoroidea. The capillary layer is never much involved. There is usually diffuse infiltration with round cells, and many mast cells.

Exudation between retina and choroid was described in only one case by Deutschmann, and in one case by Schirmer.

The choroid can atrophy into a thin pigmented connective-tissue membrane.

Tubercles have been described in all portions of the uveal tract. They never show tubercle bacilli.

Changes in the retina are rare.

The optic nerve entrance usually shows an œdematous swelling, with round-celled infiltration, and formation of new connective tissue, which finally results in optic atrophy. The changes in the nerve diminish toward the brain. The outer nerve sheath usually shows more change than the inner.

The vitreous contains fibrinous exudate and leucocytes.

The following history of a patient examined by the author is given:

J. S. 31 years of age, was admitted to the Marburg Clinic on Oct. 2, 1900. Four weeks previous, a splinter of iron had entered his left eye. He sees fingers at 1 metre. There is marked congestion. A linear scar, 1½*mm* long, is seen at the upper-outer part of the cornea. The aqueous is cloudy. Iris is cloudy. Posterior synechiæ.

On Oct. 14th, a hypopyon appears.

On Oct. 17th, an iridectomy is performed, and the opaque lens extracted. A small splinter of iron is also removed.

On Nov. 12th, the eye was normal.

On Nov. 28th, an acute uveitis appeared in the left eye, and in the evening, an acute iridocyclitis appeared in the right eye.

On Nov. 29th, the left eye was enucleated, and an inunction treatment instituted. The right eye improved, and patient was discharged on Jan. 1, 1901, with normal vision. Oph-

thalmoscopic examination of the right eye showed slight opacities in the vitreous, and in the peripheral portion of the fundus, numerous small yellowish patches. Some were superficial, and some deep. The patches became gradually more reddish, and many disappeared. Pathological examination of the enucleated ball showed the following changes:

The bulbar conjunctiva showed slight inflammatory changes. The cornea was slightly flattened, and showed a scar in the upper-outer part. A few blood-vessels were seen in the stroma.

The sclera showed inflammatory changes in its outer portion, at the points of entrance of the ciliary nerves and vessels. The iris protruded forward, the anterior chamber was shallow, and the spaces of Fontana were closed in many places. The iris tissue was densely infiltrated with round cells, and the vessels were widened and increased in number. There was marked pigmentation.

There was an artificial coloboma upward.

The ciliary body was densely infiltrated with round cells, and markedly pigmented. The muscle fibres are separated, and in places indistinguishable. The vessels are wide, and the epithelium lifted up in places by exudate. The epithelium is covered by fibrin and leucocytes. In the choroid, the layer of medium- and large-sized vessels shows most changes. There are thickening, round-cell infiltration, and hyperæmia. The suprachoroidal and capillary layers are fairly normal. There is considerable pigment. There are many mast cells, but no giant cells or tubercles.

In the posterior part of the retina, there is round-celled infiltration around the vessels, especially in the nerve-fibre and ganglion-cell layer. The anterior half of the retina is considerably changed through infiltration and exudation, so that its structure is scarcely recognizable.

The optic nerve entrance shows moderate round-cell infiltration. The nerve is thinned, as it passes through the sclera, and shows moderate infiltration about the central vessels.

The vitreous is diminished to half its bulk, and drawn forward. Between the hyaloid membrane and retina is a homogeneous exudate. No bacteria were found.

X.

RELATIONSHIP BETWEEN CORNEAL ASTIGMATISM AND SHAPE OF THE HEAD.

By Dr. SEGGEL, Munich.

The author has repeatedly noted that high degrees of astigmatism were dependent upon the shape of the head. A young woman with a very long face and orthocephalia showed a high degree of astigmatism against the rule. From the top of the head to the chin she measured 23*cm.* The width of the head was 15*cm.* The corneal astigmatism was 2.5 D.

In another patient with a very long face there was a corneal astigmatism of 4.5 D against the rule.

Cases of astigmatism with the rule were usually observed in patients with broad faces or brachycephalia.

Recently the writer had the opportunity of examining a recruit with a marked facial asymmetry.

The entire face was long. The left side of the face was narrower than the right. The left half of the forehead was higher than the right, so that the left eye was on a lower level than the right eye.

Examination of the eyes showed, on the left side, an astigmatism of 5.6 D with the rule, and on the right side, an astigmatism of 5.1 D against the rule.

Placido's disk showed, in the left eye, an oval with the long diameter horizontal, and in the right eye, with the long diameter vertical.

Examination with the ophthalmometer showed that the cornea of the left eye had a radius of curvature, in the horizontal meridian, of 7.3*mm*, and in the vertical meridian, of 6.5 *mm;* and in the right eye, in the horizontal meridian, 7.15 *mm*, and in the vertical meridian, 8.0*mm*.

The left cornea was oval in shape, with the long diameter horizontal. The vertical diameter was 10.5*mm*, and the horizontal, 11.5*mm*. In the right cornea, the vertical diameter was 11.25, and the horizontal, 11.5*mm*.

It seems as though, from the excessive length of the left half of the forehead, the left eye was hindered in its development in its vertical diameter.

The left orbit is lower than the right. Thus we found o the right side, a corneal astigmatism against the rule, with long face, while on the left side, on account of the high fore head, with low orbit, and short upper jaw, we have an astig matism with the rule.

This apparent contradiction, therefore, only strengthen the rule.

XI.

PSEUDO-GLAUCOMATOUS EXCAVATION OF THE OPTIC DISK.

By Dr. E. GLAUNING, Munich.

The relation between traumatism and secondary glaucom has been amply demonstrated. That there is any relatio between traumatism and primary glaucoma has not yet bee proven.

The following case is of interest in this connection:

B. U., 29 years of age, has always had good vision. I November, 1897, he was struck on the left side of the head b a large log of wood. He became dizzy, had pain in the hea and hemorrhage from nose and mouth. On the evening the same day he noticed a diminution of vision in the left ey

In Jan., 1898, he appeared at the clinic with a vision fingers at 1.5 metre in the left eye. In the right eye, visi $=\frac{6}{10}$. The left pupil was wider than the right. The direct r action was poor, the consensual good. In the right eye, th direct pupillary reaction was good, and the consensual poo The left eye showed arterial pulsation. There was a loss the entire nasal half of the field up to the point of fixation, the left eye. In the right eye, the field was fairly normal.

In April, of the same year, the field of the left eye showe in addition to the loss of the nasal half, a concentric contracti of the remaining portion. The optic disk was pale. The was facial paresis on the right side. The sight in the left e gradually diminished.

On Feb. 19, 1902, examination showed the following:

There was labyrinthine deafness on the right side. T facial paresis had disappeared.

The left eye showed slight conjunctival injection. No episcleral injection. Cornea was clear. Anterior chamber of normal depth. Pupil moderately dilated. Direct reaction almost gone; consensual, good. Media were clear.

The optic disk was oval, and pale bluish-white. There was total deep excavation of about 4 D, *i.e.* 1.2*mm*. All the vessels are sharply bent at the edge of the disk, the veins more than the arteries, because the arteries are more superficial than the veins. The veins are wider than normal, but show no pulsation. The arteries arise from a large bulbous dilatation in the centre of the disk. They are slightly diminished in calibre, and show marked pulsation, synchronous with the radial pulse, which extends somewhat beyond the edge of the disk. The disk is surrounded by a white ring of atrophy, about $\frac{1}{6}$ the width of the disk. The intraocular pressure is normal.

The history of the case indicates a fracture at the base of the skull, involving the left optic foramen, and extending to the petrous portion of the right temporal bone.

The labyrinthine deafness and the right facial paresis would indicate a fracture through the petrous portion of the right temporal bone.

The ophthalmoscopic picture in the left eye suggests glaucoma very strongly. Yet there are several points against this assumption. The typical transposition of the vessels to the nasal side of the disk is lacking. On the contrary, the vessels are arranged radially to the papilla, surrounding it at fairly equal intervals. In glaucoma, the vessels are usually more tangential to the papillary margin.

The tension of the eye was not increased.

The sluggish pupillary reflex in glaucoma is due partly to pressure paralysis of the iris, and partly to an atrophy of the iris. Therefore the pupillary reaction would be the same, whether direct or consensual. But in this case the consensual reaction was very good, showing that the iris itself was normal.

The clinical history was not like that of a glaucoma. It began suddenly with pain, which was not characteristic of glaucoma. There were no recurrent attacks of pain. There was immediate loss of the entire nasal half of the field. There was no history of rainbow colors or injection. The

unilateral localization, even after many years, speaks against glaucoma.

There is nothing to indicate a secondary glaucoma after intraocular hemorrhage, since he was examined three months after the accident and no trace of hemorrhage found. There was no sign of dislocation of the lens.

The excavation of the disk might be due to a weakening of the nerve substance, without any change in the intraocular pressure. The loss of the entire nasal half of the field would indicate a fracture at the temporal side of the optic foramen, with displacement of the fragments, causing pressure on the nerve. The succeeding gradual diminution of vision might have been due to a callus formation at the site of fracture. The injury resulted in an ascending and descending degeneration in the nerve. This might have been accompanied by the formation of cavernous spaces in the nerve. New connective tissue may have formed, and caused a retraction of the lamina cribrosa, thus accounting for the excavation of the disk.

The dilated arterial sac in the centre of the disk is probably an aneurysmal formation, due to retraction of nerve tissue from the arteries. This loss of support allows a dilatation of the arterial walls. This will account for the arterial pulse. It might also have been due to the neurasthenia which the patient developed as a result of the traumatism. The lack of venous pulsation is due to the diminished amount of blood supplied to the veins through the thinned arteries.

XII.

ON THE PREPARATION OF THE LIDS AND LASHES FOR OPERATIONS ON THE EYEBALL

By Dr. A. v. PFLUGK, Dresden.

In 1900, Schiötz read a paper in which he claimed that epilation of the cilia was an absolute necessity before a cataract operation. Holth proved, by bacteriological examinations, that from every cilium, without exception, pure cultures of the staphylococcus albus, and often of the staphylococcus aureus, can be obtained, without counting many other types.

During operations on the ball, it is very easy to carry organisms with the instruments, from the lashes into the wound.

Many operators cover the lashes with gauze, etc. But this diminishes the size of the operative field. Some cut the lashes short, and others epilate them.

In the last month, the author has examined the lashes of a large number of patients who have come to his clinic for operation, in order to determine the presence and quantity of bacteria on the lashes.

Seven hundred lashes, taken from 70 patients, were examined by means of cultures. Two % agar cultures in plates and tubes were used, and kept for 10 days in the thermostat, at 38° C.

The lashes were cut with sterile scissors close to the edge of the lids, and pressed into the culture medium with a sterile platinum needle.

In making these examinations, the author attempted to solve the following questions:

(*a*) Are bacteria present on the lashes of eyes with normal lids?

(*b*) Is the quantity of bacteria different on the lashes of eyes which are the seat of blepharitis or conjunctivitis?

(*c*) Is it possible, without the use of disinfecting agents, to free the lashes of bacteria?

In regard to the first question, on almost every lash bacteria were found, but the quantity of colonies was very varied. In some cases, on the third or fourth day there were only a few colonies, whereas in others, after 24 hours, there were already numerous colonies.

In normal lids, in some cases, all the lashes contained bacteria, and in others, ⅓ of the lashes were sterile. It would seem strange that the lashes, which are covered with grease, and exposed to the wind, should be sterile, but this was found in a few cases.

In regard to the second question, every lash taken from eyes with blepharitis or conjunctivitis showed, after 24 hours, numerous colonies.

In regard to the third question, it was impossible to make tests with different disinfecting solutions, in the author's clinic, for reasons of safety. The following preparations for eyeball operations are made in the author's clinic:

No preparations are made the day before the operation,

except in cases of dacryocystitis or conjunctivitis. Just before the operation, a few drops of a fresh sterile 5% cocaine solution are dropped into the eye, and the lids washed with soap and sterile water, with pieces of sterile cotton. The conjunctival sac is then gently mopped out with pledgets of cotton moistened in 0.6% NaCl solution. The eye is covered with sterile gauze containing an opening just large enough to expose 1*cm* of the lids on either side of the palpebral cleft. Then the lashes and edges of the lids are well scrubbed with sterile cotton on which are dropped about 20 drops of benzine. The eye is then covered with a pledget of cotton soaked in salt solution, until the speculum is inserted. It is especially important to use large quantities of sterile water and cotton.

Only pure benzine is used, which is obtained from the druggist. It is well known that benzine has a bactericidal action. But in the small quantities in which the author uses it, he does not think that he obtains any bactericidal effect. The effect is obtained by dissolving the layer of fat on the lashes, this fat containing all the bacteria, the interior of the lashes being sterile.

Benzine was used in two thousand operations by the author, and he has never had any bad effects from it. It causes a slight burning sensation for a few minutes, but never causes any inflammation. It is much less irritating than alcohol, ether, or any of the other fat solvents.

In order to test the efficiency of this method of preparation the lashes were examined from 30 cases thus treated, at different stages:

The first series were examined before the washing.

The second series were examined after thorough washing with soap and water.

The third series were examined after washing with benzine.

In the first series, in some patients, all the lashes contained bacteria, and in others, $\frac{2}{3}$ contained bacteria.

In the second series, it was seen that washing with soap and water had little effect on the bacteria. In some cases there was even an increase, due to carrying over of bacteria from the surrounding parts. A decided diminution was seen in 1 case.

Of 26 lashes taken after treatment with benzine, 25 lashes were sterile, and in the other, after 2 days, a few colonies were present. Since it is possible to free the lashes of bacteria absolutely, epilation or cutting off of the lashes is superfluous.

XIII.

CLINICAL AND BACTERIOLOGICAL OBSERVATIONS ON ACUTE CONJUNCTIVITIS.

By Dr. ORLANDO PES, Turin.

Every conjunctival sac, even in a normal condition, contains members of bacteria, some of them pathogenic. It is impossible, even by vigorous chemical means, to render the conjunctiva absolutely sterile. Thus we may speak of a normal physiological septic condition of the conjunctiva, which is continually being neutralized by the tears, mucus, and Meibomian secretions. In order to produce inflammation, it is necessary for the pathogenicity of the organisms to be increased through some internal or external factors.

Among these factors, we may reckon increase in virulence of the organisms, the association of micro-organisms, the mechanical and chemical irritation from various occupations ametropia, parasites, neglect of ordinary hygienic laws, etc. We must also consider the lymphatic diathesis, and all dyscrasiæ due to faulty nutrition, continued fevers, etc.

We may divide acute conjunctivitis, into acute and subacute forms:

The cases due to the gonococcus are not considered in this paper.

The cases used for this study were divided into four categories.

1.—Genuine cases of acute conjunctivitis.
2.— " " "subacute " .
3.—Cases of acute conjunctivitis in chronic cases.
4.— " " " " with recent trachoma, or cicatricial trachoma.

The technique employed in making cultures and microscopical examinations was as follows:

While the patient looks down, the upper lid is lifted with the finger, and a sterilized platinum loop is passed over the con-

junctiva of the upper fornix, without allowing the loop to brush the edges of the lids.

With this material, cultures were prepared on various media, and also cover-glass preparations made.

The results were tabulated, the first four tables being arranged according to the four categories above mentioned; the remaining eight tables being arranged according to the bacteriological findings. The tables give the name, age, and occupation of the patient, and any accompanying systemic condition. Then it states whether one or both eyes were involved. Then the organism is given, the presence or absence of mixed infection, the results of inoculation, and in the case of diphtheria bacillus the results of control inoculations in guinea-pigs which have received antitoxin.

The Koch-Weeks bacillus is not mentioned. The author considers it to be identical with Loeffler's diphtheria bacillus.

Of 76 cases of conjunctivitis examined, the bacillus of Loeffler was found in 22 cases. There were two types of bacillus, the long and the short type. For inoculation experiments, 24-hr. bouillon cultures were used. A separate experiment was made with each isolated colony. Guinea-pigs were always used in the experiments.

In each experiment, 1*cc* of the culture was injected into the right thigh of each of two guinea-pigs. In one of the guinea-pigs, as soon as manifestations of the disease appeared, $\frac{1}{2}$*c* of antitoxin was injected into the left thigh. In 7 cases, the long bacillus was found, and in 13 cases the short bacillus. They were never mixed. In three cases, the short form was found to be non-pathogenic. It could not be determined whether mixed infection increased or diminished the virulence of the diphtheria bacillus.

The guinea-pigs which died showed the ordinary changes of diphtheria. The control experiments showed that antitoxin is an effective therapeutic agent.

In 14 cases, the diplococcus of Fraenkel-Weichselbaum was found. In 3 cases, the organism was very virulent, giving rise to œdema and fibrinous exudations. In the other cases it gave rise to local œdema or abscesses, or was entirely inactive.

In the cases caused by the diplobacillus of Morax-Axenfeld

noculations into the conjunctiva of guinea-pigs was always egative. The streptococcus pyogenes was found in 9 cases. In 57 cases, the staphylococcus was found, the staph. pyog. lbus in 24 cases, the staph. pyog. aureus in 18 cases, the taph. pyog. citreus in 9 cases, and the staph. pyog. cereus lbus in 6 cases.

In recent years, conjunctivitis has been classified according o its bacteriology, and it has been assumed that each organism ives rise to a definite clinical form of conjunctivitis. But his classification does not seem to offer any advantage over he old classification, based upon clinical appearances. Cases f conjunctivitis are seen, in which are found the bacillus of iphtheria, the diplococcus of Fraenkel, the bacillus of Morax-Axenfeld, the streptococcus and several varieties of staphylococcus, together. And on the other hand, similar cases of cute and subacute conjunctivitis may be caused by any one f these organisms.

Other factors influence the clinical picture besides the infective agent. In order to determine whether, in any given case, n acute, subacute, or chronic conjunctivitis is caused by a particular micro-organism, we must combine the clinical examination with the bacteriological and experimental examinations.

Many authors, when they find several organisms in a case of conjunctivitis, pick out one as the cause of the disease, neglecting the others entirely. This is erroneous, however, since n mixed infections the associated organisms always influence he disease in some way.

XIV.

ON THE INDICATIONS FOR RESECTION OF THE SYMPATHETIC IN GLAUCOMA.

By Dr. KARL HOOR, Koloszvar.

This article is a discussion of Ziebe and Axenfeld's paper on resection of the sympathetic in glaucoma.

The author agrees with most of the conclusions arrived at in the paper.

Ziebe and Axenfeld state that in acute glaucoma resection s not to be used, except in those cases where iridectomy is efused, or where it has harmed in the first eye, as when, in pite of the iridectomy, the glaucoma continues or recurs.

There is no question that iridectomy is the operation of preference for acute glaucoma. The author has never had a case in which iridectomy was refused. It is not likely that a patient who refuses iridectomy will consent to a resection of the sympathetic ganglion.

In cases where the iridectomy was not properly performed, and the glaucoma persists or recurs, the best thing to do is to perform another iridectomy internal or external to the first, if pilocarpin or eserin have proven ineffectual.

Where, in spite of properly performed iridectomy, the glaucoma persists or recurs, sclerotomy often helps. If this does not help, another iridectomy downward might be tried.

Where iridectomy has done actual harm in the first eye and glaucoma occurs in the second eye, a resection of the sympathetic ganglion should be done. The author considers an iridectomy to have done harm when immediately after the operation the eye is hard, the anterior chamber does not re-form, and the eye becomes rapidly blind. These malignant forms are very rare.

The author believes glaucoma to be a disease of the lymphatic system of the eye, similar to a lymphangitis in other parts of the body, localized either in the anterior part of the ball, giving rise to changes in the iris-angle, or in the supra-choroideal space (Graefe's supposed choroiditis serosa), or in the lymph spaces of the optic sheath. The author saw one case of absolute glaucoma, which was enucleated, in which histological examination showed no other changes, except excavation of the disk and a diffuse cellular infiltration of the optic sheaths.

Ziebe and Axenfeld state that a sympathetic resection, without a previous iridectomy, is indicated in cases of glaucoma simplex where there is considerable diminution of vision.

In cases of glaucoma simplex where the visual field is very much contracted, the author does not advise an iridectomy, as he has often seen the vision considerably reduced by an iridectomy under such conditions. But a sclerotomy often arrests the progress of the disease for a time in these cases, and never does harm. Where a sclerotomy does not help, a resection of the sympathetic ganglion would be indicated.

In congenital hydrophthalmos, sclerotomy often does good

The results of sympathetic resection in these cases is not known.

XV.

TWO CASES OF EXOPHTHALMOS: (1) ORBITAL SARCOMA, (2) RETROBULBAR HEMORRHAGE.

By Dr. G. HIRSCH, Halberstadt.

The causes of exophthalmos may be divided into three groups:

1. Basedow's disease.
2. Multiple ocular paralyses.
3. Increase of the orbital contents.

In morbus Basedowii, both balls protrude equally, and the diagnosis can be made from the accompanying goitre, tachycardia, and nervous symptoms.

In the second group, the paralyses are more prominent than the exophthalmos.

Increase of intraorbital contents can be caused by cellulitis, dilatation of the retrobulbar vessels, hemorrhages, or tumors.

Case 1.—Chondrosarcoma of the orbit, arising from the lachrymal sac.

A. G., 55 years of age, came to the clinic on Nov. 23, 1900. On Jan. 2, 1900, he was operated on for a suppurative dacryocystitis of the right eye. The wound healed except for a small fistula.

Since the end of October, the patient noticed a painless but rapidly increasing protrusion of the right eye. When he appeared in the clinic, he showed the following condition:

In the region of the right lachrymal sac is a small fistula. Ectropion of the lower lid. The ball is displaced forward, upward, and laterally. Fundus normal. Limitation of motion, especially nasally. Diplopia. A hard mass is felt in the lower nasal part of the orbit. A diagnosis of sarcoma was made.

On Nov. 23, 1900, a rectangular incision was made parallel to the inner and lower orbital margins. A portion of the superior maxilla was found to be softened, and was removed. From the antrum of Highmore, as well as the lower and medial portions of the orbit and neighboring ethmoidal cells, were

removed hard tumor masses. On the 30th, he was again operated upon, at which time the nasal half of the orbit, and the adjacent nasal cavity as far as the sphenoidal sinus, were cleared out.

On December 17th he was discharged. On March 20 1901, he was in normal condition. No diplopia. On August 21, 1901, there was a recurrence. On November 14, 1901, he had a resection of the upper jaw, and died on the 16th.

Microscopic examination of the tumor masses showed dense cartilage cells, with very little intercellular substance. A diagnosis of chondrosarcoma was made.

The sarcoma was probably due to the long-continued inflammatory process in the lachrymal sac.

The formation of sarcomata and carcinomata after inflammatory processes has often been described.

Altland reported two cases of precorneal tumor following episcleritis.

Knapp reported a case of sarcoma of the orbit, following a blow with a billiard-cue.

Case 2.—Retrobulbar hemorrhage. Mrs. O. W., fifty-seven years of age, was first seen on June 25, 1901. At the end of May, while working in the field, she felt sudden severe pain in the left eye, with swelling of the lids. This disappeared after a few days, under warm applications. Since two weeks, there is diplopia, and a feeling of pressure in the eye.

Examination shows the left ball protruding about 10*mm* and displaced 3*mm* downward. Mobility limited, especially upward. Diplopia in every direction, except to the right. Palpation negative.

The author thought of a possible retrobulbar tumor, and gave patient ung. ciner. to be rubbed into the temple. The patient was not seen again, but several months later it was found out that there was a gradual return to the normal condition. This result, together with the history, made the diagnosis clear. The violent exercise in the field, with the bent position of the body, caused a congestion of the retrobulbar vessels, and finally a rupture of one of the vessels. There may have been some arteriosclerosis.

REPORT OF THE TRANSACTIONS OF THE SECTION ON OPHTHALMOLOGY OF THE NEW YORK ACADEMY OF MEDICINE.

By Dr. H. W. WOOTTON, Secretary.

MEETING OF MONDAY, NOVEMBER 18, 1907. DR. J. H. CLAIBORNE, PRESIDENT, IN THE CHAIR.

Dr. Arnold Knapp presented a case of **frontal-sinus empyema with unusual features.**

This patient, a woman, aged forty-six, presented the usual symptoms of chronic empyema of frontal and ethmoidal sinuses, with extension into the orbit. The swelling in the orbit had been incised and pus evacuated; the small opening closed, and the headache was very severe when the patient came under his care. The usual operation (modified Jansen-Kuhnt) was performed. The bony cerebral wall of the frontal sinus was absent, the thickened membrane lining the cavity in this region was directly adherent to the dura. The anterior bony wall was also greatly diminished, consisting in places of only the vitreous plate. The external wound healed by primary union; there is no deformity, no diplopia, and the nose is dry.

Dr. Arnold Knapp also presented a case of **retrobulbar neuritis after disease of the posterior ethmoidal cells.** Reported in full on pages 22–23, vol. xxxvii., No. 1, these Archives.

Dr. Arnold Knapp also presented a case of **gonorrhœal iritis treated by Torrey's serum.**

J. W., twenty-three years old, contracted gonorrhœa two and a half years ago, and subsequently suffered from pain

in the ankle, knee, and hip, an attack of pericarditis, and three attacks of iritis. During the last two attacks, one in each eye, he was treated with Torrey's antigonococcic serum. The iritis was characterized by marked ciliary congestion, pain, fibrinous exudation, and absence of adhesions. After the second or third injection in both attacks the eye symptoms were aggravated, in one instance the patient suffering from serum fever. The condition in the eye then rapidly cleared in two to three weeks after the onset; the eye became white in a much shorter period; some haze and congestion of the retina remained. Ten injections were given in each attack. There was occasionally some local disturbance at the site of the injection.

If one may judge from this one case, antigonococcic serum is a powerful remedy which seems to be of value and deserves further trial. Its action and the best mode of administration are at present not definitely understood.[1]

In the discussion of the case of gonorrhœal iritis, Dr. John C. Torrey stated that an interesting feature of the case presented by Dr. Knapp was the increase in inflammation and the appearance of a fibrinous exudate in the anterior chamber of the eye after the first few injections of serum had been given. This is noteworthy, because the serum has been found to call forth similar phenomena in the treatment of other forms of infection with the gonococcus. With five patients who had a more or less chronic discharge from the urethra, the first injection greatly increased this discharge, but after the third or fourth the flow of pus entirely ceased. Again, in many cases of gonorrhœal arthritis, especially in those of long standing, the first two or three injections cause a transitory increase of pain and inflammation, and may, in fact, "awaken" other articulations which have lain dormant for some time. Further injections, however, in a high percentage of cases, have led to improvement and final disappearance of the symptoms.

The most reasonable explanation of this transitory increase of inflammation seems to be that the serum injected into the patient has brought about a destruction and disin-

[1] Rogers and Torrey, "Serumtherapy in Gonorrhœal Infections," *Journal A. M. A.*, Sept. 14, 1907.

egration of the gonococci, and hence a liberation of their ndotoxins. As the serum has little, if any, antitoxic prop- rties, the freed endotoxin is not "neutralized" and ceases o be produced only after the final destruction of the gono- occi, wherever they may be located.

Experimental evidence points to the conclusion that the rimary bactericidal action has taken place directly through he presence of specific immune bodies in the serum injected, nd not through the phagocytes having been stimulated by n opsonic action.

Although the serum may have a beneficial action in cases f gonorrhœal iritis, it has been found to be of no value in he treatment of gonorrhœal conjunctivitis. In such cases nany of the gonococci are practically outside of the body nd cannot be reached by serum circulating in the blood and ymph. The same explanation applies to its inefficiency in he treatment of acute urethritis and vaginitis.

As experiments have shown that the gonococcus family s heterogeneous, the serum of late has been made as far as ossible polyvalent. Justification of this procedure is found n an increased percentage of favorable results.

Dr. C. B. Cutler asked whether the serum was toxic, and whether it was to be used with caution.

Dr. Torrey replied that the serum was not more toxic han any normal serum would be. The first, made from abbits, was toxic. That at present made from sheep was not so.

Dr. H. H. Tyson presented a case of **quinine amblyopia** ith the following history:

H. M., single, age twenty-two years, occupation porter, ame to the Eye Department of the Vanderbilt Clinic on ccount of inability to see clearly when reading. He stated hat about five years ago, while living in Jamaica, West ndies, he had a severe attack of malarial fever which lasted hree months, during which time he took large quantities f quinine (exact amount unknown). During this illness e suffered from giddiness and was greatly prostrated, being nable to feed himself or to walk. He does not remember aving had any aural symptoms during this time. Never ad syphilis nor used tobacco or alcohol. No tuberculous istory in family.

About two months after convalescence he happened to close his left eye, and noticed that his vision was very poor in his right eye. He then consulted a physician, who told him that his poor vision was due to his recent illness. Previous to this illness he is positive that his vision was good in both eyes. Subjective examination November 15th gave vision R. $\frac{2}{200}$, L. $\frac{20}{100}$. Relative central scotoma for red and green in both eyes. Perimetric examination showed color fields to be contracted to one half of normal. Ophthalmoscopic examination revealed marked temporal pallor of disks with contracted arteries, the condition being more marked in right eye. A diagnosis of chronic retrobulbar neuritis due to quinine poisoning was made.

The interesting fact in this case is that instead of total pallor and atrophy of the optic nerve we have the marked temporal atrophy with degeneration of the arteries, and the central scotoma along with the contracted color fields; placing it in the class of the two cases mentioned in literature by Jodko and Galezowski.

Drs. H. H. Tyson and L. Pierce Clark also read a paper entitled **The significance of the ocular signs and symptoms of dementia precox.**

The following is an abstract:

The report covers a period of study of two and one half years.

The cases were from private practice, clinics, and the metropolitan asylums. Definite changes were invariably found. The fundus changes as seen clinically are divided into three stages, in the order of their occurrence. First stage: congestion of the disks, hyperæmia, and œdema, dilated veins, contracted arteries, and blurring of the edges of the disks, all of varying degrees, constituting a low grade perineuritis of the optic nerve. Second stage: congestion of the nasal side, with temporal pallor of disks, dilated veins, and contracted arteries. Third stage, pallor of disks, dilated veins, and contracted arteries, constituting anæmia and partial or complete atrophy of the optic nerve.

All forms of dementia precox were under study. The more rapidly deteriorating forms show the most marked changes. The cases embraced both users of alcohol and

tobacco, and abstainers. Theoretically, the changes are probably due to a vascular toxin from liver or intestinal auto-infective origin. A vascular alteration with œdema takes place, resulting in disturbances of nutrition and slow degeneration of the nerve fibres. Cases in the first stage have shown fundus improvement under the usual treatment for intestinal auto-infective toxæmias.

Other eye symptoms found uniformly were: Enlarged pupils, negative sensory reflex, negative psychic reflex, negative Piltz reflex, diminished corneal sensibility, and concentrically contracted visual fields. No other psychosis presents similar conditions. The findings should be found useful in differential diagnosis, to a certain extent in prognosis, and possibly in the study of the pathogenesis and pathology of dementia precox.

In the discussion of this paper, Dr. Meierhof stated that he had observed a weakness of accommodation in many cerebral degenerative conditions.

Dr. Ward A. Holden stated that he had examined for Dr. Mabon, Superintendent of the Manhattan State Hospital, the fundi of twenty-five patients with dementia precox, and also for comparison the fundi of twenty-five with maniac-depressive insanity at the Manhattan State Hospital, and had recorded the findings.

He stated that Blin has reported, in a series of observations of dementia-precox patients, a persistent congestion of the optic disk in ten per cent., a persistent anæmia in eight per cent., and an alternating congestion and anæmia in six per cent., with intermittent congestion or anæmia in forty-five per cent. more. However, he wished to say that the color of the optic disk varies within wide physiological limits, and many of us do not like to speak of congestion or anæmia of the disk unless the condition is pronounced and palpably abnormal. In none of these one hundred eyes examined did he find a congestion or an anæmia that seemed to him significantly abnormal. The color of the disk may be said to depend largely upon the personal equation of the examiner.

In the twenty-five patients with dementia precox, the margin of the disk was blurred more than in the average normal eye in eleven patients. In six of these eleven the

large veins of the disk and retina were appreciably dilated. In the twenty-five patients with maniac-depressive insanity, on the contrary, there was a blurred margin of the disk in but four patients, and in but two of these were the large veins appreciably dilated.

This blurring of the margin of the disk is, in many cases of dementia precox, too pronounced to be considered physiological and must be regarded as pathological. It is due to a cloudiness of the nerve-fibre layer of the retina and optic nerve that in some cases seems to be caused by a swelling of the nerve fibres which can be individually made out, and in other cases perhaps to an œdema of this layer without swelling of the fibres, or in other cases perhaps to both of these causes combined. In half of the cases in which the margin of the disk was blurred, the veins of the retina were, as compared with the arteries, abnormally dilated. The condition may be analogous to the circulatory disturbances and œdema found in other parts of the body in dementia precox. In some cases it is so pronounced as to give rise to a characteristic picture, and from the examination of these twenty-five patients and of about an equal number previously examined of whom complete records were not kept, he would judge that the condition is to be found in about half the cases of dementia precox, and, rather exceptionally, and in a less pronounced degree, in maniac-depressive insanity.

Dr. L. Pierce Clark said that dementia precox formed nearly one-fourth of all the asylum admissions. Next to paresis it had the most hopeless prognosis as regards recovery. Kraepelin believed nearly every case underwent an early mental death. Any improvement in the prognosis must come from an earlier diagnosis. There was a pre-asylum period of several years during which many irrepressible alterations in nerve structure must be in progress. Once well established there was practically no cure of the disorder. All the somatic changes must be carefully studied. The latter often precede the mental deterioration by several months or years. It may be that a careful analysis of the vascular changes and the nutrition alterations would make this psychosis a physical disease with a mental accompaniment.

In their thesis they did not maintain that a toxic agent

was more than a form of excitant, acting upon a predisposition, which latter state or condition ought to be considered as the real cause of dementia precox. All kinds of toxic states occur in many adolescents, yet only a few peculiarly predisposed individuals develop dementia precox.

He was pleased to see that, as the effect of the conservative view which Dr. Mabon, Superintendent of Manhattan State Hospital, held at the time that Dr. Tyson and he had demonstrated the significance of their new syndrome of the eye, in October last, at the Ward's Island institution, Dr. Mabon had asked Dr. Holden to undertake a subsequent inquiry regarding this syndrome. Dr. Clark said he was not especially surprised to learn that Dr. Holden had found in two of his twenty-five cases of maniac-depressive insanity the precox eye-changes, as that was about the percentage of maniac-depressives group which turned out to be of the precox type.

Dr. Holden's congestive findings tallied very fairly with their own. If one bore in mind that Dr. Holden recognized only the congestive phase, and that all three types should be searched for, the statistics would probably agree.

The vascular toxin in dementia precox seemed to induce an anæmia and passive congestion. Both the toxic state and the vascular œdema seemed to favor neuronic degeneration, in which light only could we consider the fundus alteration in dementia precox. The eye syndrome in dementia precox was in line with the autotoxic nature of the disease, and was one of the best bits of documentary evidence for the theory that had been brought forward lately.

Finally it may be said that the autotoxic theory of dementia precox has now very easily a dominant place as a cause of the disorder.

Dr. C. E. Atwood had followed the investigations of Dr. Clark and Dr. Tyson, having seen nearly all the cases examined by them in clinic and asylum, and has come to believe so thoroughly in the eye symptom-complex in dementia precox that, if he does not find these symptoms, in one of the three stages, so well described in the paper as read, he is inclined to doubt the diagnosis.

Recently, at the suggestion of Dr. Clark, he had been

studying cases of infection at Roosevelt Hospital (through the courtesy of Dr. James) and at the Vanderbilt Clinic. Cases of typhoid, of pneumonia, of lead poisoning, quinine poisoning, of neurasthenia, with an autotoxic basis, etc., he had so studied. Many of these cases presented such disk changes as haziness of the edges and fulness of the veins, especially when there was a history of alcohol and tobacco; but in only three of the cases thus far seen was central œdema of the disk found. One of these three œdematous disk cases was a man with typhoid of forty-two days' duration; another was Dr. Tyson's case of quinine poisoning, in which there were congestion and œdema of the nasal side, with fulness of the veins and pallor of the temporal side. The vision in this case was $\frac{2}{200}$ right, $\frac{20}{100}$ left. The third case, in which there was central œdema, was a case of lead poisoning of seven months' duration. This man, a worker in a lead factory, had double wrist-drop and other symptoms of toxic neuritis, with colic, etc. Both disks showed pallor, enlarged veins, and central œdema. The fields were contracted to fifteen degrees for red, ten degrees for green. The vision was $\frac{20}{30}$. In these œdematous cases there was a central scotoma which is not found in dementia precox.

The examination of seriously ill bed-cases was facilitated by the use of an electric ophthalmoscope. This preliminary report was made, with diffidence, to stimulate other workers in the same field.

In concluding the discussion, Dr. Tyson stated that the fundus changes being present, which had been proved by recent impartial observers, there remained simply a question of percentages as to the different stages of the disorder and their significance in this psychosis. Here it was natural to have some variation of opinion, due to the personal equation of the observer and to the condition at the time of the examination, as observations at different periods are apt to show some variation, especially in the congestive stage. Dr. Holden did not mention the relative disproportion in the size of the arteries and veins, nor refer to the other stages of the disorder. So Dr. Tyson inferred that he was only looking for the appearance found in the congestive stage, thinking that was the only change found. The difference

in the relative sizes of the arteries and veins should be especially noted as it is quite a prominent sign. The veins instead of being one-third or slightly larger, are two, three, or four times as large as the arteries. The congestive stage is followed by one of anæmia, and in old chronic cases by atrophy, partial or complete, of the optic nerve. He would emphasize the fact that the value of these observations rests in the early recognition of the congestive stage, for to be able to arrest the progress of the disorder before degenerative processes ensue is of prime importance; and, finally, that in using the ocular signs and symptoms to aid in making a diagnosis, the entire eye symptom-complex should be used, and not only the appearance of the fundus oculi.

Dr. W. E. LAMBERT read a paper entitled **The surgical treatment of high myopia by removal of the lens, previously rendered cataractous.** (Abstract.)

After an historical introduction, Dr. Lambert defined the indications for the operation as a high degree of myopia where the visual acuity is unsatisfactory with correcting lens, and where a progressive tendency is observed. The patients usually selected for operation are the young, although several successful cases have been reported where the patient was of advanced age.

There is a great difference of opinion also as to the contra-indications. The generally considered contra-indications are a known hemorrhagic tendency, choroidal degeneration in macula region, loss of one eye, advanced age, ability to see well with correcting glass, detachment of the retina, and vitreous opacities.

As to the first—known hemorrhagic tendency—no doubt this would make one hesitate very seriously to perform the operation. In regard to the second objection, in both of the cases presented by the speaker choroidal degeneration existed—in one it was very extensive—and the result had been eminently satisfactory.

The dangers of the operation are infection, secondary glaucoma, intraocular hemorrhage, and detachment of the retina. Detachment of the retina is a danger greatly to be feared, but as it is very liable to occur in all cases of myopia of high degree it is impossible to determine whether it is

produced by the operation or not, some authorities maintaining that this complication is not any more likely to take place in eyes in which the operation has been done than in those not operated upon.

The different methods of operation are: direct linear extraction in the young; direct extraction, as in ordinary cataract extraction; repeated discissions, and discission with linear extraction, commonly known as the Fukula operation.

The first method is not advisable and seldom practised, as there is great danger of loss of vitreous and the reaction is usually very severe. The second method is advisable in old people, especially where the lens is more or less hardened and already somewhat opaque.

Repeated discissions and discission with linear extraction are the two methods usually employed. Repeated discissions, allowing the lens to absorb, is favored by a great many authorities, especially in America. The disadvantages of this operation are the prolonged period of treatment, the repeated danger of infection, and the frequent complication of secondary glaucoma which has to be relieved by linear extraction. Free discission with evacuation of the lens matter as soon as possible is the method which is now most generally practised and unhesitatingly endorsed by the speaker.

Dr. Lambert showed two cases upon which he had operated. The first was a patient, aged sixteen, who for ten years had been wearing O.D.— 15 D.; O.S.— 13 D. She had been suffering a great deal of discomfort with her glasses and her vision was extremely unsatisfactory. Under a mydriatic, skiascopy showed a myopia of 21 D., with a small amount of astigmatism in the right eye, and 18 D. in the left eye; vision with this correction was $\frac{20}{40}$ in both eyes. The fundus in each eye, excepting large staphyloma, was in a very fair condition, although there were some choroidal changes.

In the right eye, needling, followed two days later by linear extraction with irrigation of the anterior chamber with normal salt solution and a subsequent discission of the capsule eleven days after the first needling, obtained a clear black pupil with vision of $\frac{20}{30}$ +, with +1.50 cyl., axis 90 degrees.

The left eye of the same patient was operated upon about a month later, with practically the same experience as the right. The lens matter was removed by a linear extraction forty-eight hours after the first needling, and on the seventeenth day after the first needling a discission of the capsule gave a clear pupil with a vision of $\frac{20}{30}+$, with $+1.50+1.50$ cyl., axis 90 degrees. The patient soon overcame the diplopia which followed the operation, became accustomed to her glasses, and has been able to use her eyes for near work by wearing a $+3$ S. in addition to the correction above mentioned. The vision has improved somewhat and the last test showed practically $\frac{20}{20}$ with both eyes and Jaeger No. 1 at fifteen inches.

The second patient was thirty-one years old, and had been near-sighted from birth. When first seen she wore — 10 D. in each eye. The vision with this correction was O.D. $\frac{6}{200}$; O.S. $\frac{12}{200}$. With a —20 O.D., she then had a $\frac{20}{200}$ vision; O.S. with —16, $\frac{20}{100}$ vision. There was a large posterior staphyloma in both eyes, as well as almost extensive changes. There was also a small central opacity in the capsule of each lens. Seen about six months later, it seemed that the fundus conditions had progressed and also that the opacities on the lens had increased, although the vision was about the same. Under homatropin the vision of the right eye on October 21, 1906, was $\frac{20}{200}$ with —22 D., left eye, $\frac{20}{100}+$with —20 D.

On December 5, 1906, a discission of the lens of the right eye was made. Practically no reaction. On December 7th, a second discission. Result equally unsatisfactory. December 9th a third discission, the capsule being thoroughly opened and the lens stirred up. The result of this was most satisfactory. On the following day the lens was quite swollen and opaque. Tension normal. Very slight reaction. On December 11th a linear extraction was made, soft lens matter being removed by free irrigation with normal salt solution. Atropin and hot bathing used. December 20th: eye then perfectly quiet; all soft matter had disappeared.

On January 10th a free discission of the capsule was made with a Knapp's knife-needle, a satisfactory opening being

obtained. The vision even at that early date was $\frac{20}{60}$ with a —2 cyl., axis 90°.

The success with this eye, which was the poorer one, encouraged Dr. Lambert to proceed without delay with the other eye. On January 29th, the first needling. Reaction very slight. Little or no effect. Second needling two days later. Result also unsatisfactory. Third needling two days after (February 2d). Some slight reaction, but little or no opacity in the lens. February 7th, five days after the third needling, a fourth was made, the lens matter being thoroughly stirred up. The following day the lens was quite swollen. The eye, however, was quiet and there was little or no pain. On February 10th, linear extraction with free irrigation. The following day the anterior chamber was restored. Hot bathing and atropin.

On February 22d the patient was discharged. The capsule in this eye was much more dense than it had been in the other, and vision was consequently very poor at the time of discharge. On March 21st an opening in the capsule with a knife-needle. The result was not satisfactory. The second discission March 26th, a good opening resulting. In about three weeks a clear black, almost circular, pupil remained. Vision O.D. $\frac{20}{30}$ with —2 cyl., axis 90°; O.S. $\frac{20}{30}$ with —$1\frac{1}{2}$ S. = $2\frac{1}{2}$ cyl., axis 165°. With +3 S. added to the above, she reads Jaeger No. 1.

Dr. Lambert said the method of discission followed by linear extraction is much more expeditious than repeated discissions, and he was also of the opinion that it was much the safer proceeding.

In the discussion which followed, Dr. M. L. Foster stated that he had operated by discission alone, but thought the method of Dr. Lambert was much better. He also thought we could not always tell whether the processes in the fundus would be checked or not. In some cases the fundus changes progressed in the same way as if no operation had been performed. Still, he thought operation was indicated to give the patient the benefit of better vision for as long a period as possible. The chances of detachment of the retina in high myopia were very great anyway.

Dr. Lambert thought that he could not yet say whether

or not the fundus changes were retarded by the operation. In persons of advanced years he would do a preliminary iridectomy.

REPORT OF THE TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.

By Mr. C. DEVEREUX MARSHALL.

THURSDAY, DECEMBER 12, 1907. R. MARCUS GUNN, F.R.C.S., PRESIDENT, IN THE CHAIR.

Abstract of Mr. Nettleship's paper, **On some cases possibly allied to Tay–Sachs's infantile retinitis.**

It was suggested that the amaurotic family idiocy of Waren Tay and Sachs, although usually fatal in infancy and limited to children of pure Jewish origin, might sometimes be milder, allowing the child to live several years, or even to grow up; and that many families of Gentiles contained more or less Jewish blood. The author thought that cases such as those described by Dr. F. E. Batten, Mr. Mayou, and others, in which amblyopia, with slight changes in the macular region, came on a few years after birth and was sometimes associated with progressive cerebral degeneration, might be mild examples of Tay's disease. Also, that the same might be true of certain cases of amblyopia counted as congenital in which there was central defect in the field, and sometimes nervous or mental failure, but no tendency to early death. In the best-marked of these cases there was color-blindness, often total and complete, and day-blindness, but in the less severe ones there might be no color defect and no dislike of strong light. All these forms of not-fatal amblyopia were, like Tay's disease, liable to run in families.

SYSTEMATIC REPORT ON THE PROGRESS OF OPHTHALMOLOGY IN THE FIRST QUARTER OF THE YEAR 1907.

By Dr. G. Abelsdorff, in Berlin; Prof. St. Bernheimer, in Innsbruck; Dr. O. Brecht, Prof. R. Greeff, Prof. C. Horstmann, and Dr. R. Schweigger, in Berlin; with the Assistance of Prof. A. Alling, New Haven; Prof. E. Berger, Paris; Prof. Cirincione, Genoa; Dr. Dalén, Stockholm; Prof. Hirschmann, Charcow; Dr. J. Jitta, Amsterdam; Mr. C. Devereux Marshall, London; Dr. H. Meyer, Brandenburg; Dr. P. von Mittelstädt, Metz; Dr. H. Schulz, Berlin; Prof. Da Gama Pinto, Lisbon; and Others.

Translated by Dr. Matthias Lanckton Foster.

Sections I.–III. Reviewed by Prof. C. HORSTMANN, Berlin.

I.—GENERAL OPHTHALMOLOGICAL LITERATURE.

1. Fuchs, Ernst. *Text-book of Ophthalmology.* 11th revised edition, Leipsic and Vienna, Fr. Deuticke, 1907.

2. Axenfeld, Theodor. *Bacteriology of Ophthalmology.* Jena, Gustave Fischer, 1907.

3. Morax. *Compendium of Ophthalmology.* Paris, Masson & Co., 1907.

4. Bielschowski, A. *Dr. W. Haussmann's Stereoscopic Pictures for Testing Binocular Vision and for Use in Strabismus.* 2d ed. Leipsic, 1907. W. Engelmann.

5. Truc and Pansier. *History of Ophthalmology.* Paris, 1907. Maloine.

6. Kauffmann. **Ophthalmic remedies in the XVIth century.** *Wochenschrift f. Ther. u. Hyg. d. Auges*, 1907, No. 18.

7. Pansier. *Magistri Zachariæ tractatus de passionibus oculorum, qui vocatur sisilacera, id est secreta secretorum.* Paris, Baillière et fils, 1907.

8. Greeff, R. *Letters of Albrecht von Graefe to his Young Friend, Adolf Waldau.* Wiesbaden, J. F. Bergmann, 1907.

The text-book of Fuchs (1, **Text-book of ophthalmology**) which appeared first in 1889, presents the eleventh edition in eighteen years, the best evidence of its excellence and usefulness. In the new edition more space is devoted to the results of bacteriology so far as these tend to clear up the etiology of disease. In the theory of the perception of space the explanation suggested by Hering, which is gradually supplanting the old projection theory, is stated briefly. Supplements are added to other chapters which embody the advances of science.

Axenfeld (2, **Bacteriology of ophthalmology**) gives in this work a comprehensive presentation of the bacteriology of the eye, written not only for bacteriologists but primarily for ophthalmologists. Subjects of chapters are the normal conjunctival sac, the bacteriological basis of our asepsis, wound infections, diseases of the lids, orbits, endogenous infections of the eyes, syphilis, leprosy, and tuberculosis. The literature is comprehensively considered. Axenfeld has chosen a clinical arrangement because one purely bacteriological is wearisome and less likely to enlist the interest and co-operation of the ophthalmologist. As such a work has hitherto been lacking in ophthalmological literature its appearance will be greeted with pleasure from all sides.

The principal advantage of the pictures published by Bielschowski (4, **Dr. W. Haussmann's stereoscopic pictures for testing binocular vision and for use in strabismus**) appears in the fact that every two half pictures belonging to one another are exactly equivalent in their richness of contour by which the suppression of a half image is prevented. With binocular fusion all the pictures give an adjustment in the dimension of depth. The distance between any two half pictures belonging to each other may be varied at will. The new edition of stereoscopic pictures has been improved and enlarged.

According to Pansier (7, **Magistri Zachariæ tractatus de passionibus oculorum, qui vocatur sisilacera, id est secreta secretorum**) Zacharias lived in Constantinople in the middle of the twelfth century. His work is comprised in three volumes. The first volume deals briefly with the diagnosis of ocular diseases and of the general condition, the second

with the causes and treatment of diseases of the eye, with some remarks concerning ophthalmic surgery, the third is devoted to prescriptions directed in a very confused way against all possible diseases of the eye. Zacharias seems to have been a physician with few scruples, and with no feeling of shame he shows us how one may deceive his patients.

Among the effects of the late Dr. Schufft-Waldau, were a number of letters to the young friend and assistant of Albrecht von Graefe, which GREEFF (8, **Letters of Albrecht von Graefe to his young friend, Adolf Waldau**) has published at the solicitation of Waldau's daughter. Here we see the youthful Graefe as the pleasing, amiable man, who divides all things with his friend, how he incites him to work, enjoys his society, travels with him and studies countries, peoples, and foreign science. The amiable, winning, nature of Graefe's self-sacrificing for a friend, is presented to us nowhere else as in these letters. We see him in the little circle of his Berlin colleagues, we accompany him on his journeys, we learn his intercourse with the leading men of science, whose merits he always openly acknowledged. He was ever, even when at the acme of his fame, ready to learn from others and to influence his students in the same way. His jolly, harmless humor appears throughout.

II.—GENERAL PATHOLOGY, DIAGNOSIS, AND TREATMENT.

9. ZUR NEDDEN, M. **Experimental investigations concerning the presence of bactericide substances in the eyes of non-immunized animals.** *Archiv f. Ophthalmologie*, lxv., No. 2, p. 267.

10. ROEMER, P. **The pathogenesis of senile cataract from the standpoint of the serum investigation.** *Arch. f. Augenheilk.*, lvi., Supplement, p. 150.

11. HESS, C. **Experiments concerning the influence of ultra-violet light upon the lens.** *Arch. f. Augenheilk.*, lvii., No. 3, p. 185.

12. BRONS. **Contribution to the study of the Gram-negative diplococci of the conjunctiva.** *Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 1.

13. PAUL, L. **Experimental contributions to the knowledge of the receptor capacity of the individual tissues of the eye.** *Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 83.

14. POSSEK, R. **The antigenetic action of the vitreous.** *Ibid.*, p. 329.

15. ZUR NEDDEN, M. **Infections of the eye with streptothricæ.** *Ibid.*, p. 154.

16. Woelfflin, E. **Influence exerted by artificial means upon adaptation to the dark.** *Arch. f. Ophthalmologie*, lxv., No. 2, p. 302.
17. zur Nedden, M. **Etiology and treatment of chalk and lead deposits in the cornea.** *Arch. f. Augenheilk.*, lvii., No. 1, p. 39.
18. Baeumler, E. **Irritant action of the juice of ascarides on the human eye.** *Arch. f. Augenheilk.*, lvii., No. 1, p. 69.
19. Scherber, G. **Disease from spirochætæ.** *Zeitschrift f. Augenheilk.*, xvii., No. 2, p. 132.
20. Aubaret. **Scotomata from the observation of eclipses of the sun.** *Arch. d'ophtalmol.*, xxvii., p. 76.
21. Terson and Terson, J. **Subconjunctival injections of air in ocular therapeutics.** *Annal. d'oculist.*, cxxxvii., p. 103.
22. Zwieback, K. E. **Injections of sperminum Poehl in ophthalmology.** *Journ. med. chimie et organotherap.*, Jan., 1907.
23. Erdmann. **Successful treatment of tuberculosis of the eye with tuberculin.** *Muenchener med. Wochenschrift*, 1907, No. 14.
24. Siegrist, A. **Local anæsthesia for exteneration and enucleation of the eye.** *Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 106.
25. Schulze, E. **Concerning the influence of Bier's cervical stasis on the intraocular tension.** *Zeitschrift f. Augenheilk.*, xvii., No. 3, p. 222.
26. Hesse. **Stasis hyperæmia in ophthalmology.** *Centralbl. f., prakt. Augenheilk.*, xxxi., No. 5, p. 133.
27. Lagrange, Felix. **Improvement of a stump for an ocular prothesis by a graft from the eye of a rabbit.** *Arch. d'ophtalmol.*, xxvii. p. 150.
28. Hirschberg, J. **The magnet operation in ophthalmology.** *Berliner klin. Wochenschrift*, 1907, No. 8.

Under normal conditions the aqueous and vitreous are not bactericidal, according to zur Nedden (9, **Experimental investigations concerning the presence of bactericide substances in the eyes of non-immunized animals**). But in the test-tube they can prevent an increase of bacteria. As this peculiarity persists even after they have become inactive, the aqueous and the vitreous are not to be considered as good nutritive media for bacteria. After puncture of the anterior chamber the bactericide substances in the normal blood enter the aqueous abundantly, but they disappear again after a few hours. The vitreous also after puncture receives the bactericide substances of the normal blood, but more slowly than the aqueous, and it likewise retains them much longer than the aqueous. After puncture of the vitreous the aqueous takes on markedly bactericide properties, but puncture of the anterior chamber does not result in the

production of bactericide substances in the vitreous. Subconjunctival injections of salt promote the entrance of bactericide substances into the aqueous, but the vitreous is not influenced in this manner. The bactericide power of the aqueous and the vitreous is very much increased by inflammatory irritation, yet the bactericide material appears in larger quantities in the vitreous only when it is itself the seat of the inflammation, while the aqueous assumes bactericide properties in inflammations of the cornea and of the vitreous. In chronic inflammations the bactericide power of the aqueous is slight, even when the inflammatory process has not yet come to a standstill. Immediately after puncture of the anterior chamber bactericide substances appear in the cornea from the normal blood. This is particularly well shown in ulcus serpens in which the exciter of the disease is killed by division of the ulcer according to Saemisch.

Roemer (10, **The pathogenesis of senile cataract from the standpoint of the serum investigation**) first speaks of the physiological fluctuations of the osmotic pressure of the intraocular fluid in its relation to that of the blood serum. The osmotic pressure of the aqueous and vitreous is not higher, but in correspondence with that of the blood serum. The osmotic pressure difference between the intraocular fluid and the lens cannot be held responsible as the primary cause in the genesis of cataract, a very complicated process must take place to bring about the injury to the lens. Roemer then passes to the actions of poisons on the lens, which can certainly take up serious poisons without becoming opaque immediately. Then he speaks of the serum diagnostic reactions in senile cataract. In the human organism afflicted with senile cataract cytotoxic products act upon the lens in consequence of disturbances of internal regulations of the intermediate metabolism and produce a cataractous destruction of the lenticular elements. A special, specific composition of the serum must exist when senile cataract appears associated with disturbances of the general organism. The lenticular capsule is penetrable for bodies of the serum which have cytotoxic actions. Senile cataract is the result of cytotoxic actions upon the lens. The entrance of all such substances into the lens is subject

to the law of the specific division of corresponding receptors.

Hess (11, **Experiments concerning the influence of ultra-violet light upon the lens**) used in his experiments the Schott uviol lamp with a current of 3 to 3½ amperes. The eyes of the animals were exposed to the action of the light for from one to sixteen hours at a distance of from 16 to 20*cm* from the tube, once or several times. He found that in the majority of cases extensive and characteristic changes could be produced in the epithelium of the capsule of the lens in frogs, guinea-pigs, and rabbits. A slight haze in the area of the pupil he ascribes to signs of degeneration in the epithelium.

According to Brons (12, **Contribution to the study of the Gram-negative diplococcocci of the conjunctiva**) the true clinical picture of purulent conjunctivitis, so far as is now known, is produced by the gonococcus in the cases loaded with typical Gram-negative diplococci. These occur on the conjunctiva Gram-negative germs morphologically so similar to the gonococcus that the differentiation cannot be made from the smears alone, but necessitates the use of the culture. A greater part of these germs which so resemble the gonococcus is identical with the micrococcus catarrhalis. The gonococcus, meningococcus, and micrococcus catarrhalis are different members of a group of which the gonoccocus represents the most delicate, the micrococcus catarrhalis the stoutest form. All three varieties are easily and certainly distinguished by culture.

According to Paul (13, **Experimental contributions to the knowledge of the receptor capacity of the individual tissues of the eye**) the necessary receptors, which are needed for the neutralization of the amboceptors of the specific cytolytic serum, are present in the uvea and iris as well as in the tissue of the choroid and retina. On the contrary the receptors necessary for neutralization are absent in the vitreous, or nearly so.

According to Possek (14, **The antigenetic action of the vitreous**) the receptors of the vitreous belong to the second order. An immune serum, which is established by vitreous precipitates in homologous and heterogenous vitreous solutions, just as in homologous blood serum, and contains

hæmolytic amboceptors. Hence it may be concluded that the albumin bodies contained in the vitreous belong to the same group as those of the blood serum of the same kind, as erythrocytes of the same, and finally as the vitreous albumin of foreign kinds.

ZUR NEDDEN (15, **Infections of the eye with streptothricæ**) reports a case which seems to show that the streptothricæ must at any rate be considered in the ascertainment of the etiology of parenchymatous keratitis due to ectogenous infection.

BAEUMLER (18, **Irritant action of the juice of ascarides on the human eye**) relates a case in which the juice from a torn round worm entered a man's eye. A hard swelling on both lids with a high degree of swelling of the conjunctiva followed. The condition improved under treatment with a solution of cocain and boric acid, with lukewarm fomentations of boric acid.

According to SCHERBER (19, **Disease from spirochætæ**) the spirochæta pallida is present in acquired human syphilis in all exanthems, from the macula to the gumma, in the blood, in the juice of the spleen obtained by puncture, in the cerebro-spinal fluid, in the endarteritis of cerebral vessels, also in almost all organs of children suffering from hereditary syphilis, and in the pathological products in animals susceptible to syphilis, monkeys and rabbits. Krueckmann was able to demonstrate them in fresh papules of the iris in the human eye, Grouven found them in the cornea of a syphilitic fœtus, and according to Schlimpert and Bab they form the chief injury to the choroid. The eye of the rabbit is susceptible to the syphilitic virus.

AUBARET (20, **Scotomata from the observation of eclipses of the sun**) recalls that in 1900 he reported several such cases. Lescarret in the same year collated 31 cases of central scotoma, 16 observed by himself. The central scotoma had usually a diameter of *2mm* at the reading distance, at first it was negative, later positive. Recovery took place through clearing up of the scotoma, more rarely through concentric contraction. In one case the scotoma persisted forty-five years, in another twenty-eight years. The subjective symptoms which are at first very unpleasant become milder.

Ophthalmoscopically a marked pigmentation of the macula was observed which is only a control symptom of a central œdema of the retina. Aubaret agrees with Lescarret that a neuron interruption is caused by the photo-trauma. The sunlight produces actual changes in the rods and cones, but the other anatomical and physiological symptoms are only reflex or accessory. BERGER.

TERSON (father) and TERSON (son) (21, **Subconjunctival injections of air in ocular therapeutics**) have used subconjunctival injections of sterilized air in 57 cases of corneal disease. The authors emphasize the fact that this method is absolutely without danger and exerts a good influence on the course of diseases of the anterior segment of the globe. Photophobia in particular disappears fairly quickly. Good results were obtained in marginal corneal ulcers, even when complicated by hypopyon, in phlyctenular keratitis, in sclerosing keratitis, and in sclero-episcleritis. BERGER.

ZWIEBACK (22, **Injections of sperminum Poehl in ophthalmology**) saw rapid improvement and recovery follow subcutaneous injections of sperminum Poehl in a case of paresis of the superior rectus, associated with the third stage of syphilis, in a case of papillitis associated with tabes dorsalis, and post-partum albuminuric retinitis. The effect in six cases of optic atrophy was less brilliant and no effect at all was produced in glaucoma and detachment of the retina in a highly myopic eye. HIRSCHMANN.

A girl who had suffered from tuberculosis of the bones since childhood was attacked with an iridocyclitis and later a parenchymatous keratitis which was of a tuberculous nature, as was shown later by the tuberculin reaction. ERDMANN (23, **Successful treatment of tuberculosis of the eye with tuberculin**) began with $\frac{2}{1000}$ of a milligram and increased the amount until after sixty injections he reached the maximum of $\frac{4}{5}$ of a milligram. The result was a complete clearing up of the refractive media and recovery.

For exenteration and enucleation of the eyeball SIEGRIST (24, **Local anæsthesia for exenteration and enucleation of the eye**) introduces a curved needle with its concavity toward the eyeball and passes it between the globe and the orbit back to the entrance of the optic nerve and of the ciliary

nerves. Then he injects a 2% solution of novocain with some adrenalin. After one or two minutes the operation can be begun as then the patient will not feel the least pain.

According to SCHULZE (25, **Concerning the influence of Bier's cervical stasis on the intraocular tension**) the therapy of intrabulbar diseases has not received a more hopeful direction by the application of Bier's stasis. In experiments on animals the influence of the stasis upon the interior of the eye is marked only at first when the bandage has been applied very tightly, and then it disappears again after a very short time. In man it is impossible to employ this high degree of stasis. An increase of the intraocular tension can be detected only under specially favorable circumstances at a time when the stasis has produced cyanosis, exophthalmos, and considerable pain, and it is to be supposed that the extravasation of albumin and antibodies into the aqueous, present in animals to only a slight degree, is entirely absent in man. Therefore cervical stasis does not seem to be fitted to take the place of the less dangerous methods for the production of local hyperæmia.

In 23 cases of ulcus serpens HESSE (26, **Stasis hyperæmia in ophthalmology**) used suction hyperæmia, usually twice a day for five or ten minutes, later thirty minutes. In 18 cases the result was favorable.

LAGRANGE (27, **Improvement of a stump for an ocular prothesis by a graft from the eye of a rabbit**) transplanted the eye of a rabbit into the human orbit for the purpose of forming a stump for the support of an artificial eye in the manner suggested by Chibret. He believes that the transplanted rabbit's eye is only partly absorbed while a part remains, a belief based on two years' observation of a case in which this method was employed. BERGER.

A piece of iron enclosed in the eye is never non-irritant, according to HIRSCHBERG (28, **The magnet operation in ophthalmology**) but sooner or later results in the loss of vision. In every case of serious injury of the eye the surgeon should think of the possibility of the penetration of a piece of iron, and after confirmation of the diagnosis by the X-rays, or the sideroscope, its immediate removal by means of a magnet should be attempted.

III.—REMEDIES AND INSTRUMENTS.

29. Reuter. **The modern anæsthetics in ophthalmology.** *Inaug. Diss.*, Wuerzburg, 1907.

30. Kubly. **The use of two new anæsthetics, alypin and novocain, in ophthalmology.** *Wjest. Ophthalm.*, 1906, No. 6.

31. Kasass, J. J. **Alypin in ophthalmology.** *Wojenno-medic. Journ.*, 1907, No. 1.

32. Wicherkiewicz. **Some considerations concerning novocain anæsthesia in ophthalmology.** *Wochensch. f. Ther. u. Hyg. d. Auges*, 1907, No. 20.

33. Domenico. **Fibrolysin in ophthalmology.** *Ibid.*, No. 9.

34. Axmann. **Uviol treatment in diseases of the eye.** *Deutsche med. Wochenschrift*, 1907, No. 5.

35. Nagel, A. **Two apparatuses for the testing of ophthalmic functions. Adaptometer, and small spectral photometer (anomaloscope).** *Zeitsch. f. Augenheilk.*, xvii., No. 3, p. 205.

36. Gifford, H. **Some impressions of the Basle or inner pole magnet.** *Ophthalmic Record*, Feb., 1907.

In addition to cocain Reuter (29, **The modern anæsthetics in ophthalmology**) speaks of holocain, tropococain, stovain, alypin, and novocain.

According to Kubly (30, **The use of two new anæsthetics, alypin and novocain, in ophthalmology**) alypin anæsthesia comes on very quickly, but does not last long, causes signs of irritation and predisposes to hemorrhages, and is therefore to be recommended only in superficial brief operations. Novocain never causes signs of irritation, and its watery solutions bear repeated boilings. Solutions of 2 to 4% may be used either pure or with the admixture of suprarenin in all operations on the eye, are applicable in inflammations of the eye and not inferior to solutions of cocain.

Hirschmann.

Kasass (31, **Alypin in ophthalmology**) disputes all the advantages ascribed by Zazkin to alypin in comparison to cocain. Hirschmann.

According to Wicherkiewicz (32, **Some considerations concerning novocain anæsthesia in ophthalmology**) novocain, in a 1 or 2% solution, is preferable to cocain because it exerts no influence on the pupil or accommodation. Its anæsthetic action in inflamed tissue is particularly mentioned. Wicherkiewicz injects a solution which consists of novocain

0.125, suprarenin 0.00016, natr. chlor. 0.225, and distilled water to 25.0.

Domenico (33, **Fibrolysin in ophthalmology**) claims that fibrolysin has a scar-softening action and that therefore its use is indicated in corneal opacities and for the resorption of inflammatory exudates.

Axmann (34, **Uviol treatment in diseases of the eye**) treated a case of lupus of the face which had caused severe chronic conjunctivitis, ectropion and corneal opacities with uviol rays. After 60 sittings not only was the lupus healed but the corneal opacities had cleared up so much that the patient was able to go about alone, whereas previously be had to be led.

Nagel (35, **Two apparatuses for the testing of ophthalmic functions. Adaptometer, and small spectral photometer**) describes an adaptometer devised by him, an apparatus for the measurement of the light sense, and a small spectral photometer, an apparatus for the mingling of spectral colors for diagnostic purposes (anomaloscope).

Gifford (36, **Some impressions of the Basle or inner pole magnet**) has had constructed a circular electromagnet on the plan of that used by Mellinger in Basle. It has the advantages of great ease in manipulation of the small cores which may be used, but it is doubtful if it can equal the Haab instrument in magnetic force. Alling.

Sections IV.—VII. Reviewed by Dr. ABELSDORFF, Berlin.

IV.—ANATOMY.

37. Raehlmann, E. **Anatomy and physiology of the pigment epithelium of the retina.** *Zeitschr. f. Augenheilk.*, xvi., No. 1, p. 1.

38. Fritsch, G. **Comparative studies of the human fovea centralis.** *Anatom. Anzeiger*, xxx., p. 462.

39. Wolfrum. **Development and normal structure of the vitreous.** *Archiv f. Ophthalmologie*, lxv., No. 2, p. 220.

40. Tsuchida, M. **Concerning the nuclei of origin of the nerves that govern the movements of the eye and the tracts in the midbrain and interbrain related to them.** *Arbeiten aus dem Hirnanatomischen Institut in Zürich*, 1907, vol. ii.

41. Terrien, F. **Influence of the insertion of the zonular fibres**

upon the form of the equator of the crystalline lens. *Arch. d'opht.*, xxvii., p. 152.

Raehlmann (37, **Anatomy and physiology of the pigment epithelium of the retina**) supposes that the outer joints of the rods and cones originate as cuticular excretions from the pigment epithelium. The pigment of the epithelium originates, as is usual in animal bodies, through hæmatogenous chromogen which, borne by the lymph current to where it meets with albuminous bodies of suitable affinity, unites with the latter to form colored bodies. The pigment of the retinal epithelium originates in this way. At the commencement of the formation of pigment at the posterior pole first granules and later rods appear, the latter to the retinal side of the former. In birds the development of the granule pigment is contrary to that in mammals in that it first appears at a later period, but in birds also the processes directed toward the retina are exclusively of rod pigment. Another difference is in the color. The granule pigment is deep red brown, the rod pigment bright brownish yellow. The difference of the embryonal development, the form, the position, and the color, leads Raehlmann to the conclusion that the rod pigment of the retina is entirely different from all other kinds of pigment, especially from the granule pigment of the uvea, and that a peculiar physiological importance in the act of vision appertains to it.

Fritsch (38, **Comparative studies of the human fovea centralis**) sums up the results of his investigations of the human retina of different races in nineteen conclusions from which the following may be taken. The cones of the human retina are of cylindrical construction, the angular forms are due to lateral flattening from their pressure against each other. Such hexagonal cylindric forms are found in the peripheral zones of the fovea, while in the centre the foveal cones are loosely arranged and cylindrical in the majority of cases. The effect of this loose arrangement of the cones is to give an enlargement of visual acuteness, especially as the thickly placed cones are the finest in diameter, so that in such foveæ the fineness of the form of the cones aids their arrangement in the production of the highest power of vision.

Examination with a loupe revealed no foveæ in the al-

binotic eyes of a Herero, the microscopic examination showed numerous and strongly developed rods which were less common in the central area, while the diameter of the cones was only ⅔ of the usual. The author looks upon the incompleteness of the fovea as the impression of an early increase of the visual cells in the embryo. The elements became separated from each other through the later growth of the eye.

Wolfrum's (39, **Development and normal structure of the vitreous**) studies in regard to the genesis of the vitreous were made on birds, amphibia, and mammals. In birds and amphibia it was only shown that in the beginning the development of protoplasmic unions between the rudiments of the lens and retina takes place without involvement of mesoderm cells. In mammals the results have but one meaning and show the vitreous to be a purely ectodermal formation originating from the retina. In the development two divisions are to be distinguished. 1. A primitive vitreous, which is characterized by originating from radiating fibres from Mueller's basal cells. 2. The formation of the final condition, which arises from the radiating fibres through formation of transverse anastomoses and is responsible in its later development chiefly for the pars ciliaris retinæ.

The lens is not involved in the formation of the vitreous. The lens cone serves as a temporary fixation apparatus of the little lens sacs loosened from the ectoderm. Only nutritive functions pertain to the mesoderm, particularly the vascular system, in the development of the vitreous. The limitans interna retinæ has no sharp delimitation from the vitreous, which is without an outer membrane of its own. The origin of the zonule of Zinn is similar to that of the vitreous. The hyaloid canal is not constant in swine, oxen, or sheep. When present it is usually associated with remains of the hyaloid artery.

Tsuchida's (40, **Concerning the nuclei of origin of the nerves that govern the movements of the eye and the tracts in the midbrain and the interbrain related to them**) monograph is quite comprehensive and only a brief reference can be made to certain points. In man only the so-called principal nuclei are anatomically constant, while others, such

as the Edinger-Westphal and the central nucleus of Perlia, exhibit remarkable individual variations, particularly as to size and grouping of the nerve cells, and to delimitation of the nucleus. A true, sharply defined central nucleus of Perlia exists in only 20% of the cases and is found in the anterior third of the oculomotorius column of cells. The median gray wedge of the central gray matter is not to be confounded with this. Least constant of the accessory nuclei is Panegrossi's nucleus dorsalis posterior. Tsuchida could not demonstrate in his preparations a group of cells corresponding to the lateral nucleus of Bernheimer, which he reckons among the varying cells of the formatio reticularis. With regard to the more delicate relations of origin of the roots of the oculomotorius he distinguishes intranuclear fibres, intranuclear root fascicles, intracerebral root fascicles, direct fibres, commissures, association fibres, and decussations within the oculomotor nucleus. There is no true decussation of root fibres but a loose interweaving of fibres of very variable origin. There is also transition of the oculomotor nucleus column into the trochlearis nucleus. The two nuclei are separated by a narrow gray partition.

As an ophthalmoplegia interna was observed in a man with an intact Edinger-Westphal nucleus, and on the contrary pupillary reaction was preserved with defect of this nucleus on one side the author is opposed to both Bernheimer's and Majano's teaching in regard to the innervation of the pupil. A case studied clinically and anatomically by him showed that most probably the small ganglion cells on the frontal pole of the lateral principal nucleus of the oculomotorius are related to the innervation of the pupil. The group of nuclei in question lies entirely in the bed of the third ventricle. The eye muscles are not quite diffusely supplied in the third nucleus, but for each muscle there is a representation partly local, partly in common with the other muscle nuclei.

Terrien (41, **Influence of the insertion of the zonular fibres upon the form of the equator of the crystalline lens**) confirms the tent-like sloping of the margin of the lens described by Topolanski and agrees with the latter that it is the result of the tension of the fibres of the zonula. Corre-

spondingly the equator of the lens is not exactly circular as correctly claimed by Magnus in 1891. BERGER.

V.—PHYSIOLOGY.

42. NAGEL, W. A. **Experiments with railroad signal lights on persons with normal and abnormal color sense.** *Zeitschr. f. Sinnesphysiol.*, No. 41, p. 455.

43. SCHWARZ, O. **Accommodative micropsia.** *Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 42.

44. POLAK, A. **Physiological rôle of the yellow pigment at the macula.** *Compt. rend. de l'acad des sciences.* Paris, Nov. 26, 1906.

NAGEL'S (42, **Experiments with railroad signal lights on persons with normal and abnormal color sense**) experiments contradict the claimed fact that persons who are color blind according to the usual tests can still make the desired discrimination of color without error with the actual railroad or ship signals. The arrangement of the experiments was such that the lights used in practical railroad service, red, green, and so-called white, were shown in varying intensities and sizes of field upon a dark background. Although the conditions for the observation of the signal lights were more favorable than in actual work, and confusion was excluded for persons with normal color sense, yet dichromates and others with abnormal color sense made numerous errors.

SCHWARZ (43, **Accommodative micropsia**) says that the change in the size of the retinal image in changes of the accommodation co-operates doubtless with micropsia, but that the change in the size of the image in accommodation is too unimportant to be advanced as the only explanation of accommodative micropsia. The appearances of micropsia and macropsia are usually clear only in monocular vision, or are clearer than in binocular. In the former case the estimated size of the fixed object is dependent on the distance of the subjective point of fixation, *i.e.*, of the point which corresponds to the impulse of convergence, and the convergence is not corrected by binocular perception of depth. But with the innervation for accommodation and convergence is joined a change of the retinal measure, or a change in the estimation of distance.

POLAK (44, **Physiological rôle of the yellow pigment at the**

macula) explains why the eye does not exhibit disturbances of vision due to chromatic aberration by assuming that the short-waved rays are absorbed by the yellow pigment of the macula. The fact is the accommodation apparatus of the eye is adapted to the long-waved rays, as is shown by the fact that with Badal's optometer for white and red light the same vision was obtained with the same adjustment.

BERGER.

VI.—REFRACTION AND ACCOMMODATION.

45. POSSEK, R. **The influence of different strengths of illumination upon the visual capacity of emmetropes and myopes.** *Arch. f. Hygiene*, lx., No. 2, p. 144.

46. LUNDSGAARD. **Hypermetropia with diabetes mellitus.** *Zeitschrift f. Augenheilk.*, xvi., No. 2, p. 156.

47. BAKER, A. R. **A statistical inquiry as to the relief and cure of migraine by the correction of errors of refraction.** *Oph. Record*, Jan., 1907.

POSSEK (45, **The influence of different strengths of illumination upon the visual capacity of emmetropes and myopes**) examined thirty emmetropes and thirty myopes by having them read a Greek test letter at an average distance of 60*cm* in different strengths of light and determined the time needed for the reading. The length of time served as a measure of the visual capacity. The results for emmetropes were: The average loss of capacity caused by reduction of the light was

from 30-meter candles to 10-meter candles 1.26%.
" 30 " " " 6 " " 7.05%.
" 30 " " " 3 " " 18.34%.

In myopes the average loss was considerably greater:

from 30-meter candles to 10-meter candles 10.52%.
" 30 " " " 6 " " 26.01%.
" 30 " " " 3 " " 38.57%.

Even if a brightness of 6-meter candles suffices for emmetropes in school hygiene yet for the myopes a minimum of 10-meter candles is needed.

LUNDSGAARD's (46, **Hypermetropia with diabetes mellitus**) fifty-seven-year-old patient had in March, 1902, emmetropia and perfect vision. In 1906 she was suffering from diabetes mellitus and had a hypermetropia of the right eye

of 2.5 D., of the left eye of 2 D. Toward the end of the year the patient no longer excreted sugar and she was emmetropic again.

Baker (47, **A statistical inquiry as to the relief and cure of migraine by the correction of errors of refraction**) tabulates the results of treatment of one hundred patients who suffered from migraine. He concludes that the predominating cause is astigmatism, especially when the axes are oblique. Anisometropia and heterophoria are also frequent causes. Alling.

VII.—MUSCLES AND NERVES.

48. Geronne. **See-saw pupils.** *Zeitschr. f. klin. Med.*, No. 50, p. 377.

49. Wicherkiewicz. **An abnormal insertion of the internal rectus.** *Klin. Monatsbl. f. Augenheilk.*, xliv., p. 200.

50. Bumke. **Relations between lesions of the cervical spinal cord and reflex immobility of the pupil.** *Ibid.*, xlv., p. 257.

51. Schlesinger, H. **Horizontal oscillations of the globe on closure of the lids, a form of co-movement not hitherto described.** *Neurol. Centralbl.*, No. 26, p. 242.

52. Levinsohn, G. **Congenital oculomotor paralysis with continual changes of the pupils.** *Zeitschr. f. Augenheilk.*, xvii., No. 4, p. 341.

53. Warschowsky. **Recurrent oculomotor paralysis.** *Westn. Ophthalm.*, 1907, No. 1.

54. Blanluet and Caron. **Paralysis of the sixth pair after spinal stovainization.** *Annales d'oculistique*, cxxxvii., p. 62.

Geronne (48, **See-saw pupils**) observed a pupillary difference with prompt reaction in a patient with mitral stenosis and insufficiency. At first the left pupil was the larger, with a slight degree of enophthalmos of the left eye and perspiration on the left side of the brow and face. Later the right pupil was the larger. This change was frequently observed and at times the pupils would be of the same size. The author thinks that the cardiac branches of the sympathetic were affected in sympathy with the changes in the heart and sometimes the filaments going to the left, sometimes those supplying the right, were stimulated. Another possibility is that the reflux of blood through the jugular veins to the cava superior was aggravated by the very movable heart, and that an intracranial stasis was caused with right or

left irritation. At any rate the author thinks there is a causal relation between the disease of the heart and the see-saw pupils.

Wicherkiewicz (49, **An abnormal insertion of the internal rectus**) found in an advancement of the internal rectus to correct a divergent strabismus that the internus was inserted by two tendons, separated vertically from each other by a distance of *4mm.* This space decreased backward so as to form a triangle with its apex in the belly of the muscle, *16mm* from the line of insertion.

Bumke's (50, **Relations between lesions of the cervical spinal cord and reflex immobility of the pupil**) experiences tend to oppose the view that the cause of reflex immobility of the pupil is to be sought in the cervical spinal cord. Bach's experiments, so far as they may be taken into account in human pathology, contradict the dependence of light rigidity upon changes in the cervical spinal cord because the complete separation of the entire spinal cord from the after-brain did not influence the movements of the pupils. Reichardt's view that the reflex rigidity of the pupils is caused by a disease within Bechterew's intermediate zone between the second and sixth cervical segments is disproved. The observations recorded in literature of lesions of the cervical cord with consecutive reflex immobility of the pupil do not stand. There is thus no reason to consider the view confuted that immobility of the pupil is caused by a disturbance of the reflex arch between the primary optic centre and the oculomotorius nucleus.

Schlesinger (51, **Horizontal oscillations of the globe on closure of the lids**) had under observation a patient who developed a paresis of the right facial and hypoglossus after suppuration of the parotid and abscess of the neck. A slow, swinging movement of the eyeballs in the horizontal plane was excited by gentle closure of the lids. As the facial paresis improved the movements of the eyeball could be excited no longer by gentle, but only by forcible closure of the lids, and were no longer horizontal, but irregularly up and down, outward and inward, until they disappeared simultaneously with the progressing recovery from the facial paresis. In all probability the horizontal move-

ments of the eyeballs were due to central disturbances of innervation.

Levinsohn (52, **Congenital oculomotor paralysis with continual changes of the pupils**) observed a six-year-old girl who had paralysis of the right oculomotorius and continual changes in the size of the right pupil. While light and convergence exerted no influence the impulse to adduction caused dilatation, the impulse to adduction or to contraction of the orbicularis contraction. A spasm of the accommodation of 2.5 to 3 D., demonstrable skiascopically, accompanied the contraction of the pupil. The focus of the paralysis Levinsohn located in the nucleus and roots of the oculomotorius.

Warschowsky's (53, **Recurrent oculomotor paralysis**) patient, forty-six years old, had suffered for twelve years from repeated attacks of severe headache on the left side, lasting two or three days, with weakness and nausea, and trembling of the entire body. Toward the end of the attack ptosis with paralysis of all the branches of the oculomotorius would appear which would pass away after two or three weeks leaving a slight paresis of some branches and partial optic atrophy. During the attack the vision was 0.3 to 0.4. After the attack it was 0.4 to 0.5. The macular portion of the papilla was pale. There was a history of syphilis, malaria, and of a severe blow on the head fourteen years before. The right eye was sound, vision 1. The author believes that in this case the disease was extracerebral, at the base of the skull near the orbital fissure, where the first branch of the trigeminus, the oculomotorius, and the opticus lie close together, and consisted of a recurring, descending neuritis, probably the result of the blow on the head. Hirschmann.

Blanluet and Caron (54, **Paralysis of the sixth pair after spinal stovainization**) describes a case of paralysis of the left abducens which resulted from an injection of stovain into the spinal cord for the purpose of anæsthesia. Eleven cases are tabulated in which paralyses of eye muscles have followed the use of injections of stovain or novocain into the perimedullary lymph space. In all of them the paralysis of the eye muscle appeared from four to twenty days after the injection.

Sections VIII.—XII. Reviewed by Dr. R. SCHWEIGGER, Berlin.

VIII.—LIDS.

55. Possek, Rigobert. **Contribution to the knowledge regarding gangrene of the lids.** *Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 211.

56. Snydacker, E. F. **Plastic operation on the lid with pedicled flaps from the neck.** *Ibid.*, p. 71.

57. Cuperus. **A case of carcinoma of the eyelid with xeroderma pigmentosum.** *Nederl. Tydschrift voor Geneesk.*, 1907, Bd., 1, No. 4.

Possek (55, **Contribution to the knowledge regarding gangrene of the lids**) reports two cases of gangrene of the lids. One was a staphylococcus infection not preceded so far as known by any traumatism to the lid or its neighborhood. The cocci throve anaërobic also. The disease followed a very acute but favorable course and the defect was covered with Thiersch grafts. The other case was one of a comparatively mild influenza which was followed by tenonitis and later by gangrene of the lid. In this case also the margin of the lid escaped necrotic destruction thanks to its particularly good blood supply.

In two patients with extensive vascular nævi of the face and cicatricial ectropion Snydacker (56, **Plastic operation on the lid with pedicled flaps from the neck**) formed a pedicled flap from the angle of the jaw to the clavicle, 15 to 20*cm* long, turned it and split is so as to form the lid. The skin of the neck is softer and more fitted for plastic work than the skin of the face. After the lid flaps have become attached the pedicled flap can be turned back and replaced in position.

Cuperus (57, **A case of carcinoma of the eyelid with xeroderma pigmentosum**) met with a case of xeroderma pigmentosum in a little girl ten years old and described the disease, which almost always passes over into carcinoma, which starts in one of the pigmented spots. This disease may be ascribed to the action of the sun's rays, it is rare and is always of a very serious nature. Jitta.

IX.—LACHRYMAL PASSAGES.

58. Warschowsky, J. **Ophthalmological observations. II.—Acute bilateral inflammation of the lachrymal glands.** *Westn. Ophthalm.*, 1907, No. 1.

59. Le Gendre. **Double dacryoadenitis with fronto-maxillary sinusitis caused by influenza.** *Soc. méd. des hôpit.*, Paris, March 8, 1907.

60. Krailsheimer. **Tuberculosis of the lachrymal gland.** *Klin. Monats. f. Augenheilk.*, xlv., No. 1, p. 112.

61. Struycken. **Contribution to the surgical treatment of epiphora.** *Nederl. Tydschrift voor Geneesk.*, 1907, Bd. 1, No. 4.

62. Gerard, Georges. **The natural obstacles to catheterism of the lachrymal passages.** *Annales d'oculistique*, cxxxvii., p. 193.

63. Fejer, I. **Congenital dacryocystitis of the new born.** *Archiv f. Augenheilk.*, lvii., No. 1, p. 23.

64. Ollendorff. **Dacryocystitis of the new born.** *Sitzungsber. Wuerttemb. Augenaerzte. Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 113.

Warschowsky (58, **Acute bilateral inflammation of the lachrymal glands**) reports a case of acute bilateral inflammation of the lachrymal glands. The patient, thirty-two years of age, had a severe inflammation of the palpebral lachrymal glands and later of the submaxillary and sublingual salivary glands. The process began with inflammation of the conjunctiva associated with swelling of the preauricular glands. The temperature rose to 38.5°. Duration ten days.

Hirschmann.

Le Gendre (59, **Double dacryoadenitis with fronto-maxillary sinusitis caused by influenza**) observed a bilateral dacryoadenitis and a bilateral inflammation of the frontal sinus and of the antrum of Highmore as the result of influenza in a woman in the seventh month of pregnancy. Complete recovery followed washing out these accessory sinuses with antiseptic solutions. Berger.

An orbital tumor in a young man with pulmonary disease was diagnosed as a fibrosarcoma after excision of a part for examination. Krailsheimer (60, **Tuberculosis of the lachrymal gland**) undertook its radical extirpation by means of Kroenlein's operation and then found that he was dealing with a case of tuberculosis of the lachrymal gland.

Struycken (61, **Contribution to the surgical treatment of epiphora**) has recommended on a former occasion to remove the palpebral portion of the lachrymal gland in cases of epiphora. Because the result has not always proved satisfactory he now says to remove the orbital portion of the gland as well. The operation is not difficult and can be done with-

out general anæsthesia. The hemorrhage is slight, no deformity is produced, and the result is very good.

Struycken also describes two other cases. He constructed an outlet for the tears through the antrum of Highmore in a patient who had been previously operated on and had a junction between the antrum and the nasal cavity. In another patient on whom he had already operated he brought about a connection with the ethmoid cells. The desired effect was produced by both operations, although a slight conjunctivitis resulted.

Gerard (62, **The natural obstacles to catheterism of the lachrymal passages**) describes a number of anatomical varieties of the lachrymal passages which may be of practical importance in the passage of probes. 1. A tuberosity of the posterior wall of the lachrymal fossa of the lachrymal bone into which the musculus orbicularis palpebrarum and Horner's muscle are inserted. 2. A spur-like bony process of the anterior wall of the naso-lachrymal canal. 3. Varieties of the lachrymal fossa and of the canthus among which the latter passes into the nasal duct. 4. Variations in the inclination and length of the bony lachrymal canal. 5. Anomalies of the puncta and canaliculi. A fold of mucous membrane in the lower canaliculus seems to be particularly of importance as a hindrance to the introduction of probes.

Berger.

The cases of dacryocystitis of the new born observed by Fejer (63, **Congenital dacryocystitis of the new born**) presented on the third day of life or later pus with an almost unaltered cunjunctiva and no gonococci. In such cases the trouble is a faulty development of the mucous membrane of the duct. In no case did he find nasal deformity or injection of the mucous membrane. Massage of the sac may be tried, but this is associated with danger to the cornea if applied by the laity. Fejer divides the lower canaliculus and passes sound No. 3, increased later to No. 6. The passages of the new born dilate easily, the probe must be carried clear down and turned. Often the suppuration disappears after the first probing, but frequently the probing must be persisted in for weeks before all secretion has gone.

Ollendorff (64, **Dacryocystitis of the new born**) is of the

opinion that dacryocystitis of the new born almost always precedes the conjunctivitis which disappears with the removal of the affection of the sac. After simple massage of the sac one is not sure there will not be a recurrence, a single probing with No. 2 on the contrary gives radical help.

X.—ORBITS AND ACCESSORY SINUSES.

65. Lewis, F. Park. **Pulsating exophthalmos. Ligation of the orbital artery. Recovery.** *Oph. Record*, Feb., 1907.

The patient of Lewis (65, **Pulsating exophthalmos**) a man of twenty-six, was struck upon the back of the head, and after a few weeks developed a pulsating exophthalmos. This gradually increased for a year. A tense pulsating tumor could be felt through the upper lid and a bruit heard. A diagnosis of aneurism of the ophthalmic artery was made and an operation revealed the artery enormously distended. It was ligated close to its entrance into the orbit and, although it was evidently distended farther back, the recovery was complete. The eyeball was preserved. A duplicate of this remarkable case does not appear in literature. Alling.

XI.—CONJUNCTIVA.

66. Villard, H. **Pathological histology of conjunctivitis due to atropin.** *Archives d'ophtalm.*, xxvii., p. 9.

67. Gourfein. **The infectious conjunctivitis of Parinaud.** *Revue gén. d'ophtalmologie*, xxvi., p. 54.

68. Seefelder. **Prophylaxis against ophthalmia neonatorum.** *Muenchener medizin. Wochenschrift*, 1907, No. 10, p. 475.

69. Reiss, W. **Primary tuberculosis of the bulbar conjunctiva.** *Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 158.

70. Wagenmann. **A case of papilloma of the caruncle with carcinomatous degeneration in a young person.** *Muench. med. Wochensch.*, 1907, No. 18, p. 911.

71. Coppez, H. **Nature and mode of formation of the pigmented conjunctival spots which accompany melanotic tumors of the conjunctiva.** *Arch. d'ophtalmologie*, xxvii., p. 67.

72. Harlan, H. **A case of chronic pseudomembranous conjunctivitis with development of ocular and pharyngeal diphtheria on the use of jequirity.** *Ophthalmic Record*, March, 1907.

73. Bordley, J. **Trachoma in the American negro race.** *Bulletin Johns Hopkins Hospital*, Feb., 1907.

The pathological examination of atropin conjunctivitis

showed VILLARD (66, **Pathological histology of conjunctivitis due to atropin**) that the conjunctival nodules resemble those of granular conjunctivitis. The size of the granules is the same, and there are many pathological analogies between atropin conjunctivitis and trachoma follicles. Usually the former corresponds to the follicular conjunctivitis, and the clinical features of the two diseases show so many analogies that they are frequently confounded. BERGER.

GOURFEIN (67, **The infectious conjunctivitis of Parinaud**) observed the onset of Parinaud's conjunctivitis in the right eye of a shoemaker seventeen years old. The evening rise of temperature (38.5) observed by the writer in two unpublished cases also, the swelling of the lymphatic glands, the paleness and weakness of the patient suggested the presence of tuberculosis of the conjunctiva, but this was disproved by bacteriological investigation and animal inoculation. This case makes the number yet described 48. Gourfein points out that in none of these cases has the transmission of the conjunctival disease to other persons been observed. In only three cases was the cornea involved in two of which there was a marginal ulcer and in one doubtful case pannus. Recovery leaving no trace took place in all cases. BERGER.

SEEFELDER (68, **Prophylaxis against ophthalmia neonatorum**) has treated the one eye of 500 infants with acetate of silver, the other with nitrate of silver for prophylactic purposes, and has come to the conclusion that the acetate of silver is not inferior in intensity and mildness to the nitrate and is always harmless because it does not become stronger through evaporation.

In REISS's (69, **Primary tuberculosis of the bulbar conjunctiva**) case there was an elevation as large as a pea on the nasal side of the globe which penetrated into the neighboring sclera. The conjunctiva over the tumor was movable. The condition had been present six months. A superficial excision was made in order to avoid too deep penetration into the sclera. After some weeks there was present a painless tumor $1\frac{1}{2}cm$ in size, of a rosy color and with superficial yellowish nodules. Fine opacities appeared in the vitreous. The patient withdrew from observation after the beginning

of the injections of tuberculin which produced both general and local reaction.

Wagenmann (70, **A case of papilloma of the caruncle with carcinomatous degeneration in a young person**) removed from a fifteen-year-old girl a pale red tumor of the inner canthus which extended from the upper punctum to near the lower and involved the caruncle. Five years later a recurrent tumor as large as a hazel nut was removed, and this operation was followed in four weeks by another recurrence. Three years later a tumor as large as a small fist infiltrated the upper and the lower lids and surrounded the opening of the orbit. The orbit was exenterated and has remained free from recurrences.

Coppez (71, **Nature and mode of formation of the pigmented conjunctival spots which accompany melanotic tumors of the conjunctiva**) who watched a melanosarcoma arising from a pigmented spot on the conjunctiva comes to the conclusion based on the histological examination of the extirpated tumor, that first of all an increase in volume and pigmentation of the fixed connective-tissue cells takes place. Only here and there between the latter are weakly pigmented sarcoma cells by the proliferation of which the connective tissue is destroyed. The pigment granules set free from the connective-tissue cells are taken up by the sarcoma cells and extend into neighboring regions through the vessels. The pigment granules contained in the sarcoma cells did not originate within them. Berger.

Harlan (72, **A case of chronic pseudomembranous conjunctivitis with development of ocular and pharyngeal diphtheria on the use of jequirity**) treated a case of monocular membranous conjunctivitis of long standing with various applications without result. The only germ found was staphylococcus aureus. After using jequirity the child developed diphtheria in the throat. Whether this was due to contagion starting from some undiscovered germs in the conjunctiva, or whether it was independent of the eye trouble, is undecided by the author. Alling.

Bordley (73, **Trachoma in the American negro race**) believes that all reported cases of trachoma in the American negro are through a mistaken diagnosis. Three cases which

gave the clinical appearances of the disease showed no definite granular bodies under the microscope, and got well without cicatrices. He found the xerosis bacillus in all three, and believes it capable of producing a conjunctivitis simulating trachoma at least in the negro. ALLING.

XII.—CORNEA, SCLERA, ANTERIOR CHAMBER.

74. ZUR NEDDEN. **Etiology and treatment of lime and lead opacities of the cornea.** *Archiv f. Augenheilk.*, lvii., No. 1, p. 39.

75. MONTHUS, A. **Interstitial annular keratitis.** *Archives d'ophtalmologie*, xxvii., p. 105.

76. BARTELS, KARL. **Contribution to the pathological anatomy of keratitis disciformis.** *Inaug. Diss.*, Rostock, 1907.

77. FROMAGET. **Keratitis due to pneumococci cured by antidiphtheritic serum.** *Annales d'oculistique*, cxxxvii., p. 59.

78. KAUFMANN, E. **Clinical studies of recurrent erosion.** *Klin. Monatsbl. f. Augenheilk.*, xlv., No. 1, p. 202.

79. FLEISCHER. **Melanotic tumor on the outer margin of the cornea.** *Münchener medizinischer Wochenschrift*, 1907, No. 10, p. 499.

80. VERHOEFF, H. **Tuberculous scleritis—a commonly unrecognized form of tuberculosis.** *Boston Med. and Surg. Journal*, March, 1907.

ZUR NEDDEN (74, **Etiology and treatment of lime and lead opacities of the cornea**) points out that true albuminoid substances occur only in traces in the cornea and that pure albumin does not form a precipitate or union with lime water, the flocculi which are formed in experiments with egg albumin are produced by means of distilled water and never by means of abundant and concentrated lime water. The precipitate formed in albuminoid solutions of human origin with officinal lime water is delicate and punctate, not flocculent, soluble in hydrochloric acid, and is therefore calcium carbonate, not albuminate. Of the organic substances of the cornea, collagen about 80% and mucoid 20%, the collagen exhibits no affinity towards calcium, but the mucoid is dissolved by it. The corneal opacity is produced by this latter process and the formation of carbonate in the second place. Thus are formed purely chemical opacities without inflammatory reactions which can best be dissolved chemically by ammonium tartrate in eye baths. Lead opacities of the cornea are but slightly soluble, but the incrustation can frequently be scraped off.

Monthus (75, **Interstitial annular keratitis**) reports two cases of annular interstitial keratitis observed by him in Prof. de Lapersonne's clinic and agrees with those authors who consider this to be simply a rare variety of the ordinary interstitial keratitis. The etiology and the treatment are the same for both. That the annular interstitial keratitis is caused only by syphilis is incorrect. Berger.

Bartels (76, **Contribution to the pathological anatomy of keratitis disciformis**) examined an eye microscopically which became painful from keratitis disciformis three weeks after a slight injury, grew worse again five months later, and was finally removed after the death of the patient from pleuropneumonia and streptococcus pyæmia. There was a vesicle formation in the epithelium, a disk-shaped opacity in the deeper layers of the parenchyma of the cornea, and deposits on the posterior surface of the cornea. There were no micro-organisms or signs of ectogenous infection. Bartels agrees with Peters that keratitis disciformis is a variety of herpes corneæ affected by an unknown influence of the nervous system.

Fromaget (77, **Keratitis due to pneumococci cured by antidiphtheritic serum**) observed two cases of severe progressive hypopyon keratitis produced by pneumococci which were not improved by proper local treatment, subconjunctival injections of cyanide of mercury, or paracentesis of the anterior chamber, but got well after the use of diphthèria serum. The author advances no hypothesis to explain this phenomenon. Berger.

Kaufmann (78, **Clinical studies of recurrent erosion**) distinguishes between the traumatic keratalgia, in which the apparently smoothly healed loss of substance may be easily opened up again with a blunt instrument; the recurrent erosion, in which the epithelial opacities with great loosenings of epithelium exist for months and years; and finally the erosions unhealed in consequence of the misuse of lead water or cocain. In fresh erosions he uses dionin, antiseptic ointments, bandage, perhaps removal of loose epithelium; in a recurrence removal of the diseased epithelium, brushing the surface of the wound with chlorine water and otherwise as in fresh erosions. When such treatment has repeatedly

failed he carefully applied the galvanocautery superficially to the diseased place. In one case he saw an ulcus rodens, in another keratitis disciformis develop from erosions.

The young man described by FLEISCHER (79, **Melanotic tumor on the outer margin of the cornea**) had a tumor *1mm* thick, *6mm* broad, *8mm* high and covering a third of the cornea which had been growing for five years on the corneal margin. Its outer processes penetrated the deep layers of tissue as dust-like pigment so that it did not seem possible to remove it entirely. These usually sarcomatous pigment tumors are not accustomed to cause metastases but endanger the eyeball by recurrence.

VERHOEFF (80, **Tuberculous scleritis—a commonly unrecognized form of tuberculosis**) believes that most cases of scleritis are tuberculous, supporting this opinion by study of thirteen cases. In only three of these did he find evidence of the disease elsewhere. All of them presented the nodular form. He further calls attention to the frequent occurrence of additional small elevations of one or more *mm* in diameter in the vicinity of the principal lesion. These latter show a tendency to quickly disappear and return again. No tubercle bacilli were found nor was there caseation, but otherwise the lesions showed the characteristics of tuberculous tissue. He used Koch's old tuberculin and obtained reaction and improvement. ALLING.

VI.—**Le Catarrhe Printanier** (Spring Catarrh). Report of Prof. AXENFELD (Freiburg) to the Congress of the French Ophthalmological Society, 1907. Paris: G. Steinheil, 1907.

This monograph deals principally with the pathogenesis, treatment, and certain aspects of the pathological anatomy of this remarkable and puzzling disease. The presence of eosinophile cells in the discharge may aid in an early diagnosis. Bacteriological examinations have thus far been negative—in fact, absolute necessity to admit an infectious agent does not exist. Many attempts have been made to bring spring catarrh in relation to certain skin lesions. Kreibich believes that summer prurigo and the eye affections have a common cause, and treatment by excluding the sun's rays by an occlusive bandage has produced a marked diminution of the ocular changes (Dimmer). Axenfeld is not however convinced of this action of light. As to the state of the general health, there are usually a polyadenopathy and an alteration of the blood (lymphocytosis). As to treatment, occlusive bandage should be tried, also protecting glasses, residence in mountainous altitudes, and attention to the general health, with due regard to the nose. Surgical intervention is indicated in pronounced cases; local medical treatment is purely symptomatic.

This research is a monument to the painstaking industry of the author. There are a number of colored plates of the histological processes, and there is appended a complete bibliography.

A. K.

VII.—**The Commoner Diseases of the Eye.** By CASEY A. WOOD and THOMAS A. WOODRUFF. Third edition. 597

pages. Chicago: W. T. Keener & Co, 1907. Price, $2.50 net.

This short text-book designed for medical students now appears in a new (3d) edition. The parts on physiology, histology, and gross anatomy have been enlarged and supplied with more illustrations. Dr. Frank Brawley has written a new chapter on the relation of nasal disease to the eyes. The book is sufficiently complete, the style brief and clear, and seems to answer the wants of the medical student. There are many illustrations generally adequate, some rather crude, those of conjunctival bacteria indistinct (p. 221 to 226), and the chart of color fields (p. 131) incorrect.

A. K.

VIII.—**Ophthalmia Neonatorum.** By SIDNEY STEPHENSON. The Middlemore Prize Essay of the British Medical Association, 1907. 258 pages. London: George Pullman & Sons. 1907. Price 12/6 net.

This book begins with figures on the *prevalence* of ophthalmia of the new-born according to Continental and British statistics. The proportion of ophthalmia cases to all cases treated in eye hospitals varies from 0.24 to 1.25 per cent. The proportion to all registered births varies from 0.45 to 2.35 per cent. The proportion of eyes damaged as the result of ophthalmia neonatorum in eye hospitals is 22.85 per cent. In the reduction of the ophthalmia neonatorum cases the most important factor is the universal use of antiseptic precautions in midwifery, though the preventive measures are not without influence.

An historical sketch follows on the changes on the views of *etiology* up to the general acceptance of the gonococcus; recent bacteriological investigations have shown it to cause about sixty per cent; the remainder is due to the pneumococcus, bacterium coli, and others. The mechanism of infection is next studied; the greatest evidence points to the infection taking place directly after birth. A tabulated list of 71 cases of ante-partum ophthalmia is appended and the author adds nineteen others from his own practice. Those not due to a premature escape of the waters, the author thinks can be best explained on the theory of a local, intrauterine infection.

Under *diagnosis* mention is made that ophthalmia of

the new-born may be confused for disease of the lachrymal sac. *Prognosis* depends not only on the severity of the local process but also on the nutrition of the baby. *Prevention* is secured by the instillation of a one per cent. solution of nitrate of silver; this strength of solution is harmless and efficient. Supplementary measures consist among others in the obligatory notification of the disease and in the education of the public to the danger of ophthalmias in babies. The book contains a vast amount of information, replete with literary references.

A. K.

IX.—**The Ophthalmic Year Book,** 1907. By E. Jackson and G. E. de Schweinitz. The Herrick Book and Stationery Company, Denver, Colo.

The fourth year of the Ophthalmic Year Book contains abstracts and additions to ophthalmic literature of the year 1906, properly classified and indexed. Biographical sketches of prominent oculists who had died during the year are added. The book represents a great deal of labor on the part of the authors. The subject-matter is well presented and will be found interesting and instructive to every one desirous of keeping abreast with the literary outputs. The book is so good as to deserve a better quality of paper.

A. K.

X.—**Ophtalmologie Microbiologique.** By Dr. A. Gabrielidès. Constantinople: A. Christidos. 1907.

The author makes a strong plea for the microscopic diagnosis of conjunctivitis. A clinical description then follows of the forms of conjunctivitis with known bacteria (diplobacillus of Morax, Week's bacillus, Pfeiffer's bacillus, gonococcus, etc.), with paragraphs on the morphology and staining properties of the bacteria and treatment. This group is presented in a synoptical table. The method of making a microscopic specimen of the discharge, the staining methods popular in France, and the best culture media are described. A great deal of this can be found in any text-book on bacteriology. Each bacterium is then studied in detail and the literature appended. The second group is represented by the conjunctivitides with unknown, invisible organisms, such

as trachoma, Parinaud's conjunctivitis, etc. The third group is toxic conjunctivitis (gonococco-toxin, gout, caterpillar, jequirity). The remainder are grouped as amicrobic. The diseases of the cornea, lids, lachrymal passages, iris, choroid, and optic nerve are treated from a similar bacteriological standpoint. Lumbar puncture and examination of the cerebro-spinal fluid is also given.

The plan of the book is surely novel and very modern, perhaps somewhat ahead of its time; it is at any rate suggestive. Unfortunately its study is made difficult by an obscure classification, many typographical errors, extremely poor bookmaking, and the regrettable absence of an index. These can, however, all be easily remedied, and it is to be hoped that another edition will bear the mark of one of the many excellent Paris publishers. A. K.

XI.—**Photoscopy** (Skiaskopy). By MARK D. STEVENSON, Akron, Ohio. Illustrated. Philadelphia and London: W. B. Saunders & Co. 1906. Price, $1.25 net.

The author endeavors to supply a thorough understanding of the optical principles involved in this most useful test so that better practical results can be obtained. He has seen fit to give the method a new name. The apparatus, methods, optical principles, and general rules and considerations are all clearly described and the book should prove of value. A. K.

XII.—**The Pathology of the Eye.** By J. HERBERT PARSONS. Vol. III. General Pathology, Part I. New York: G. P. Putnam's Sons. 1906. Price $3.

The third volume of Parsons's excellent work includes congenital anomalies, ametropia, the circulation and nutrition of the eye, the normal intraocular pressure, and glaucoma. The circulation and nutrition of the eye are the only adequate descriptions in English of these important subjects. A chapter on the theory of immunity is timely and valuable. The high standard set by Mr. Parsons in the previous volumes is fully maintained. A. K.

XIII.—**Die Photographie des Augenhintergrundes** (Pho-

tography of the Fundus Oculi). By Prof. F. Dimmer (Graz). Wiesbaden: J. F. Bergmann. 1907. Price, 14 Mk.

After ten years, Dimmer has succeeded in photographing the eye-grounds as the accompanying pictures show. The many difficulties encountered and overcome are enumerated in this book. After describing the various methods which have been published, the author briefly reviews the advantages of a photographic impression, the difficulties encountered (reflexes, extent and sharpness of definition, uniform illumination, etc.), and gives a full description of the apparatus itself, its management with the details of the various steps. Though the apparatus seems a very complicated and expensive one, the taking of the picture is simple and requires but a few minutes. The apparatus can also be used as a demonstrating ophthalmoscope. The fifteen plates show the apparatus and give reproductions of instantaneous photographs of various fundus-changes taken by the author. Compared with previous attempts they show a great advance. Many of them are exceedingly clear, giving an excellent general view of the fundus, especially of the distribution of the vessels and of gross lesions. As pictures of the fundus the want of color with its contrasts is felt the most. This of course may be corrected by the perfection of color photography. A. K.

XIV.—**The Royal London Ophthalmic Hospital Reports.** Edited by W. Lang. Vol. XVII., Part I. January, 1908. London: J. & A. Churchill. Price, 5/.

This number contains the following articles: E. Nettleship on "Retinitis Pigmentosa and Allied Diseases" (continuation). W. Ilbert Hancock, "Hereditary Optic Atrophy." George Coats, "Pathology of Coloboma of the Optic Nerve." George Coats, "Congenital Pigmentation of the Papilla." M. L. Hepburn, "Visual Fields in Retinitis Pigmentosa." M. S. Mayou, "Lachrymal Abscess in the New-Born." J. H. McIlroy, "Sympathetic Ophthalmia, Some Anatomical Considerations." C. Goulden, "The Fate of Eyes after Extraction of a Foreign Body by the Electro-Magnet."

A. K.

XV.—**The Practitioner's Medical Dictionary.** By G. M.

GOULD. Illustrated. Philadelphia: P. Blakiston's Son & Co. 1907. Limp leather. Price $5.

This dictionary is quite up to date, containing the recently adopted anatomic terms and the preparations as given in the last revision of the Pharmacopœia. In addition to these features it is complete, the illustrations have been well selected, the print is clear, and the get-up of the book convenient and attractive. As far as medical dictionaries are concerned, the English reader can have no fault to find, and this can be recommended as one of the best.

A. K.

OBITUARY.

Herman Snellen died in Utrecht on January 18th at the age of 73 years.

The son of a physician, he received his medical education in Utrecht, and from his association with Donders early became identified with the development of Ophthalmology. In 1877 Snellen became Professor of Ophthalmology at the University of Utrecht, in which post he was succeeded in 1898 by his son, Herman Snellen, Jr. He was instrumental in building the new Eye Hospital in Utrecht, which is one of the finest in the world.

Snellen's literary contributions were many and on varied subjects, physiological, clinical, and operative. A favorite topic was the anomalies of refraction and accommodation. Together with Landolt he contributed the chapters on the "Functional Examination of the Eye" in the first edition of *Graefe-Saemisch*. His test-types are in universal use. He devised new operations for deformities of the lids and in recent years suggested an improvement in artificial eyes. The part on operations in the second edition of *Graefe-Saemisch*, which he began, will be completed by Landolt and Axenfeld.

As a physician and a skilful operator Snellen enjoyed a world-wide reputation. A prominent figure at all congresses, as a man he was beloved by all; his courtesy and hospitality are attested by many who visited Utrecht to learn at his side. Another of the great ophthalmological lights has been extinguished; the remembrance, however, of Herman Snellen cannot be effaced.

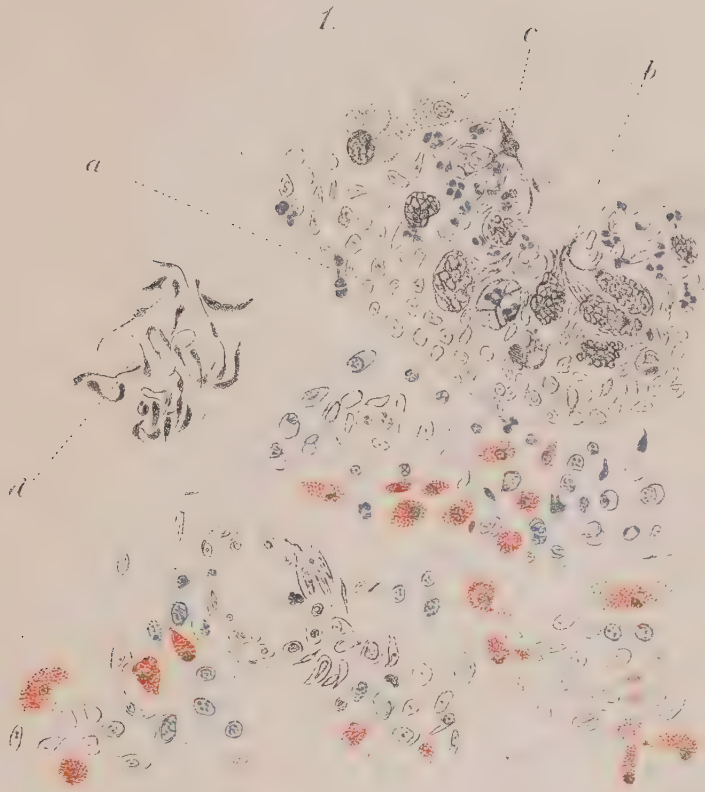
NOTICES.

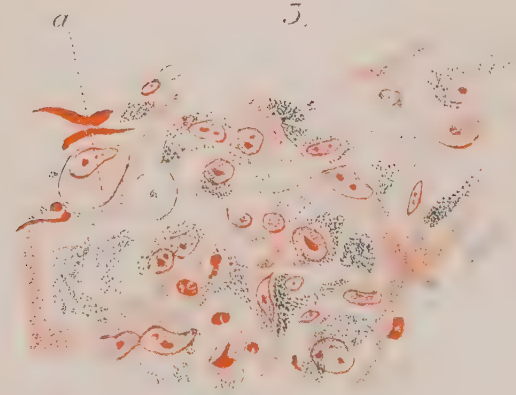
The annual meeting of the French Ophthalmological Society will take place in Paris on May 4th. The "rapport" will be on the "Treatment of Wounds of the Eye" by A. Terson of Paris.

The Sixth International Congress of Ophthalmology will be held at Naples, April second to seventh, 1909. The President is Marc Dufour; Vice-President, E. Landolt; President of the Organization Committee, A. Angelucci. The corresponding members for the United States are Herman Knapp, 26 West Fortieth Street, New York City, and G. E. de Schweinitz, 1705 Walnut Street, Philadelphia. The subjects proposed for discussion are: (1) The determination, in respect to indemnity, of the value of a lost or damaged eye; (2) The unification of the measure of visual acuteness and the unification of the notation of the meridiansof astigmatism.

Professor Roemer for many years first assistant to Professor Hess at the University Eye Clinic in Würzburg and well known for his researches on immunity, is now full Professor of Ophthalmology and Director of the University Eye Clinic in Greifswald.

Copies of the Transactions of the Ophthalmological Society of the United Kingdom will in future be issued periodically in fasciculi.





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